

2331 N 64 13399*

SPECIAL ENGINEERING REPORT

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Code 1

RESEARCH CENTER

NASA CR 55268

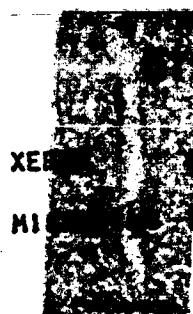
SUBJECT:

LOW TEMPERATURE

MINIATURE BEARING FRICTION STUDY

FINAL REPORT

CONTRACT NAS 5-2833



PRICE

15.50 ph
2.19 m

NEW
HAMPSHIRE  BALL BEARINGS, INC.
PETERBOROUGH, N. H.

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HAMPSHIRE** BALL BEARINGS, INC.
PETERBOROUGH, N. H.

$\sqrt{64} - 13399$
(NASA CR 55268)

OTS: #15.50 ph. #7.19
mf

1 [LOW TEMPERATURE
MINIATURE BEARING FRICTION STUDY
FINAL REPORT
(NASA CONTRACT NAS 5-2833)]

[5]

Prepared by: Engineering Department, NHBB

November, 1963

INTRODUCTION

The purpose of the work in Contract NAS 5-2833 was to develop experimental test data on torque levels, both running and starting, for lubricated bearings at various low temperatures. Both a silicone and a MIL-L-6085A lubricant were used each with two distinct quantity levels. The bearings selected, cover a variety of miniature sizes and were tested at distinct loading levels up to two pounds, with five separate speeds from starting to 10,000 rpm being used. The loading was applied by two different means, preloading and dead-weight loading. The bearings with appropriately sized raceway-face relationships, to result in a preload on the bearings when clamped, were reported in the Third Quarterly Progress Report dated October, 1963. That report now becomes part of the Final Report. The second method of loading was obtained by a dead-weight load on a single bearing and the results of these torque measurements are found in this volume of the Final Report. In all cases, three levels of temperature were used which were 21°C (70°F), -29°C (-20°F), and -54°C (-65°F).

DISCUSSION OF DATA

The starting torque values for bearing sizes SFROP and SFR1PP were obtained under a 75-gram load using the Eclipse Pioneer Starting Torque Indicator due to limitations on the minimum torque readability of the running torque instrumentation. The limitations of the Eclipse Pioneer equipment in the case of low temperature determinations involve frosting problems associated with the use of air as the torque balancing medium. The starting torque values of all other single bearings were obtained with the use of the running torque fixturing and

indicators which eliminate this type of frost difficulty. Regardless of the equipment, the same procedure of averaging six starts and standard loading for the Eclipse Pioneer test were used. The three smaller bearings, SFR0P, SFR1PP, and the SFR144PP were tested with a 75-gram load while the larger SFR2-6PP and SFR166PP bearing had a 400-gram load in accordance with the specification for the Eclipse Pioneer starting torque test.

As discussed in the Third Quarterly Progress Report the relationship of torque to viscosity appears to be much the same in testing single bearings as was noted in duplex bearings. That is, the relationship between viscosity and torque are considerably different for the two different types of oils tested.

It has been our experience, in room temperature torque testing of duplex bearing pairs, that the torque of the pair is generally more than the sum of the torque of the two bearings when tested separately under equal conditions, including loading. We have speculated on the reason for this and can only suggest that if it were possible to build perfect bearings, the sum of the two single bearing torques might equal the preloaded pair under equal conditions. When reviewing the relationship of torque in preloaded SR144PP and SR166PP bearings compared to the torque recorded in this section for SFR144PP and SFR166PP single bearings, a tendency has been observed toward the duplex pair torque being more than twice that of corresponding single bearing test. At the same time, some graphs recording high torque levels appear to be fairly close to a two to one torque relationship of duplex to single bearings. This appears to be reasonable considering the probability of the fluid resistance due to the high oil viscosity being the major torque contributor.

EXPLANATION OF DATA

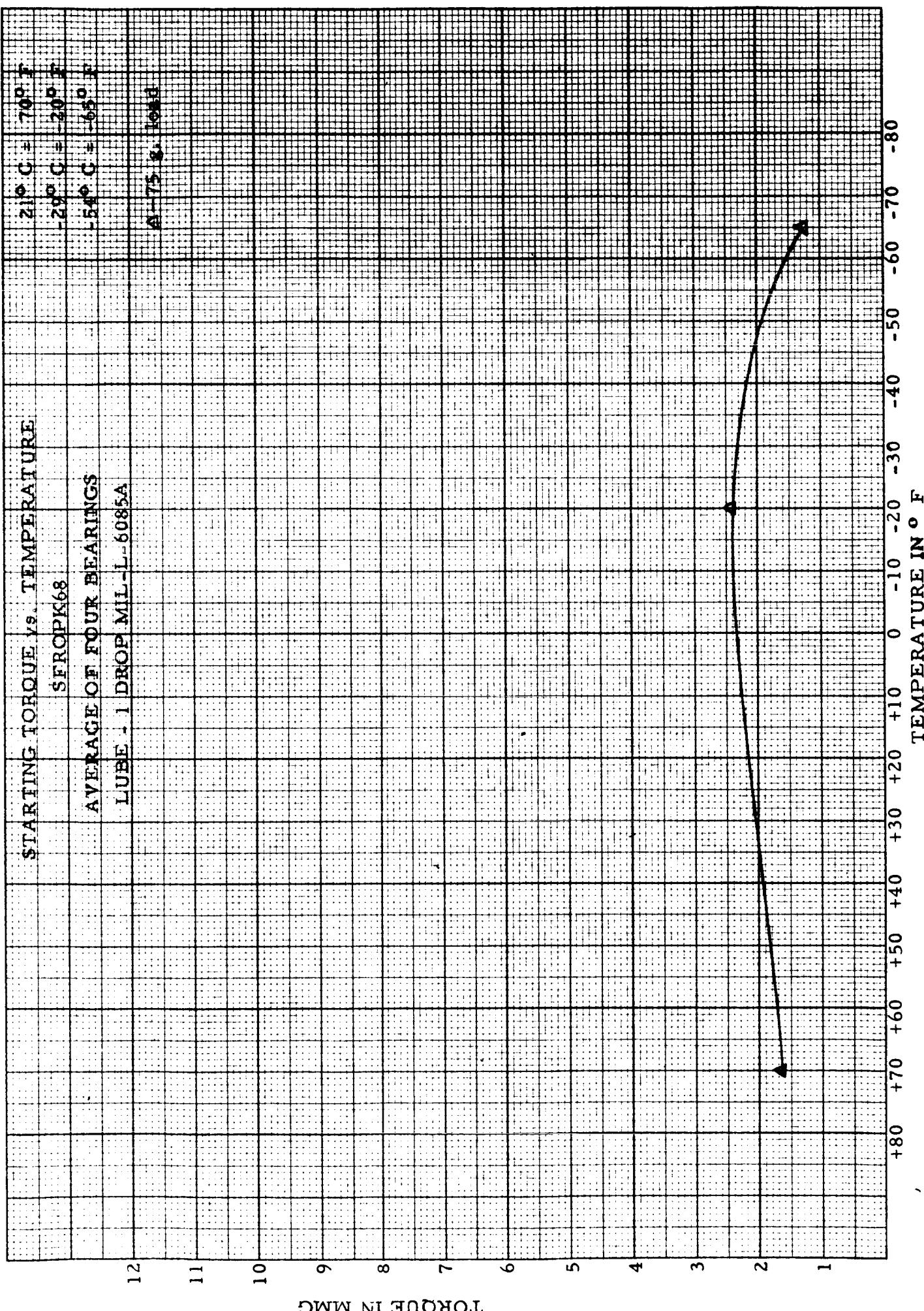
The following data is arranged by bearing size, lubricant, and lubricant quantity. The units of torque are in millimeter grams (mmg) which convert to other units as listed below:

1 millimeter gram	=	1000 milligram millimeters
1 millimeter gram	=	0.10 gram centimeters
1 millimeter gram	=	0.001388 inch-ounce
1 inch-ounce	=	720 gram centimeters
1 inch-ounce	=	7200 millimeter grams
1 inch-ounce	=	720,090 milligram millimeters

TEMPERATURE CONVERSION

$^{\circ}\text{C}$	$^{\circ}\text{F}$
+25	+77
+21	+70
+20	+68
-25	-13
-29	-20
-30	-22
-50	-58
-54	-65
-55	-67

The data has been tabulated with torque measured in mgmm and plotted in mmg as an aid to the appearance of the graphs. The relationship of 1 millimeter gram (mmg) to 1000 milligram millimeters (mgmm) should be noted to prevent confusion.



TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR0PK68

1 Drop MIL-L-6085A

Six Starts Per Bearing Under 75-Gram Load
Starts at 70°F

Brg. No.	1	2	3	4	5	6	Avg.
1	1000	1360	1560	1560	1680	1680	1473
2	1360	1560	1560	1680	1920	2000	1680
3	1560	1560	1680	1680	2000	2000	1717
4	1560	1560	1920	1920	2000	2000	1827
			Average Total Torque of Four Bearings				1682

at -20°F

1	1600	2000	2200	2400	2480	2480	2193
2	2000	2400	2480	2480	2760	2760	2480
3	2000	2400	2400	2480	2760	2760	2467
4	2400	2480	2480	2760	2760	2880	2627
			Average Total Torque of Four Bearings				2446

at -65°F

1	1160	1200	1200	1280	1560	1560	1327
2	1000	1200	1280	1280	1600	1600	1327
3	1160	1200	1200	1280	1280	1560	1280
4	1000	1160	1200	1200	1600	1600	1293
			Average Total Torque of Four Bearings				1307

Readings are in mgmm

PACIFIC NATIONAL EQUIPMENT
BOYLSTON, MASS.
MADE IN U.S.A.

PILOT 3127 PAPER

STARTING TORQUE VS TEMPERATURE

SFR0PK08
 $\frac{1}{2}$ Pound Load

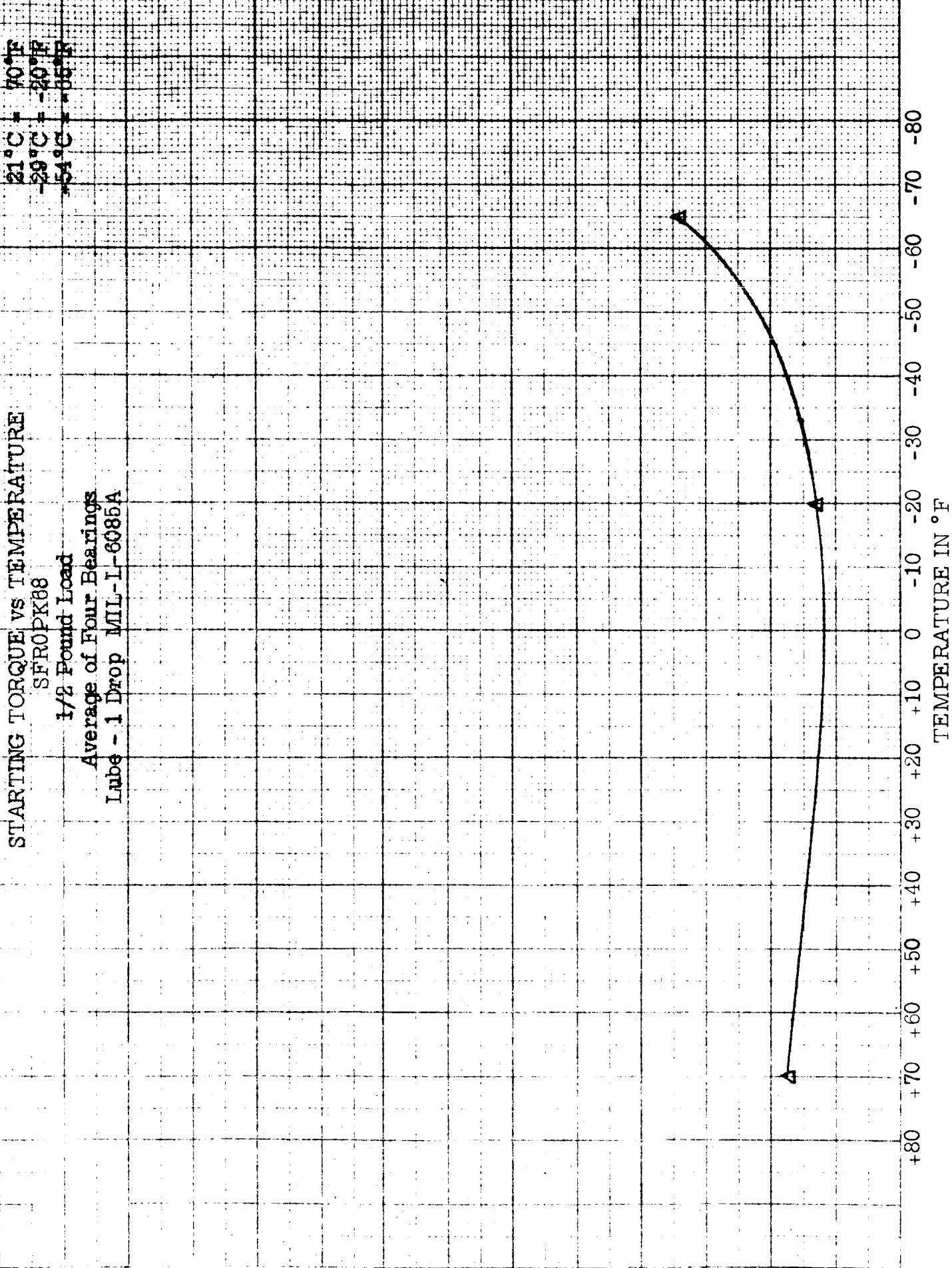
Average of Four Bearings
Lube - 1 Drop MIL-L-6086A

30

TORQUE IN MCG

20

10



TORQUE vs SPEED at VARIOUS TEMPERATURES

SFROPK68

1/2 Pound Load

Average of Four Bearings

Lube - 1 Drop MIL-L-1-6085A

20 °F
20 °C
-29 °C
-54 °C
-65 °F

70

60

50

40

30

20

10

0

TORQUE IN MMG

1000

3000

6000

10000

SPEED IN RPM

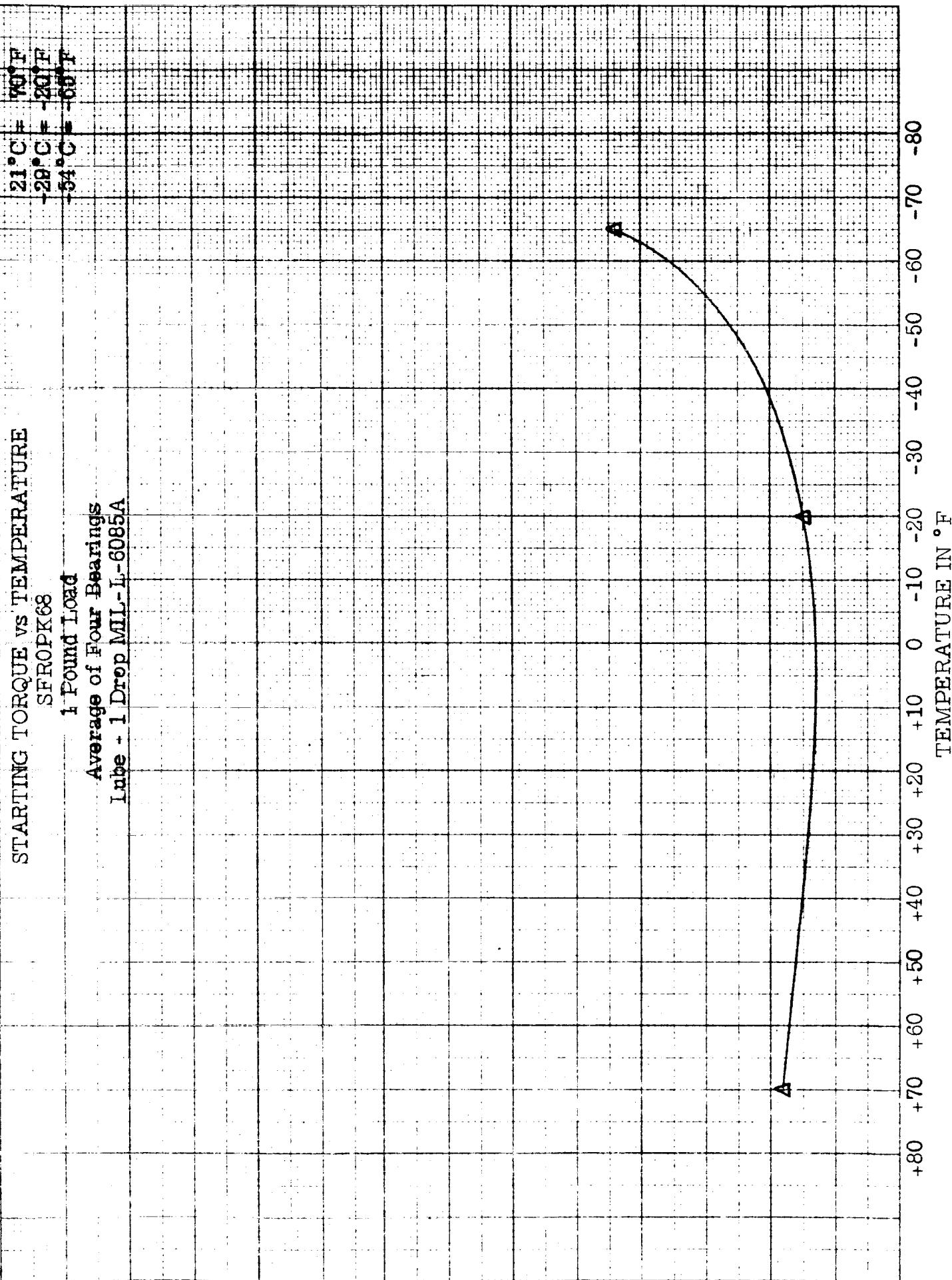
STARTING TORQUE VS TEMPERATURE

SFR0PK68

1 Pound Load

Average of Four Bearings

Lube + 1 Drop MIL-L-6085A



TORQUE vs SPEED at VARIOUS TEMPERATURES

SFROPK68

1 Pound Load

Average of Four Bearings

Lube - 1 Drop MIL-L-6085A

21°C 70°F
-29°C -20°F
-54°C -65°F

70

TORQUE IN MMG

60

50

40

30

20

10

A

1000

3000

6000

10000

SPEED IN RPM

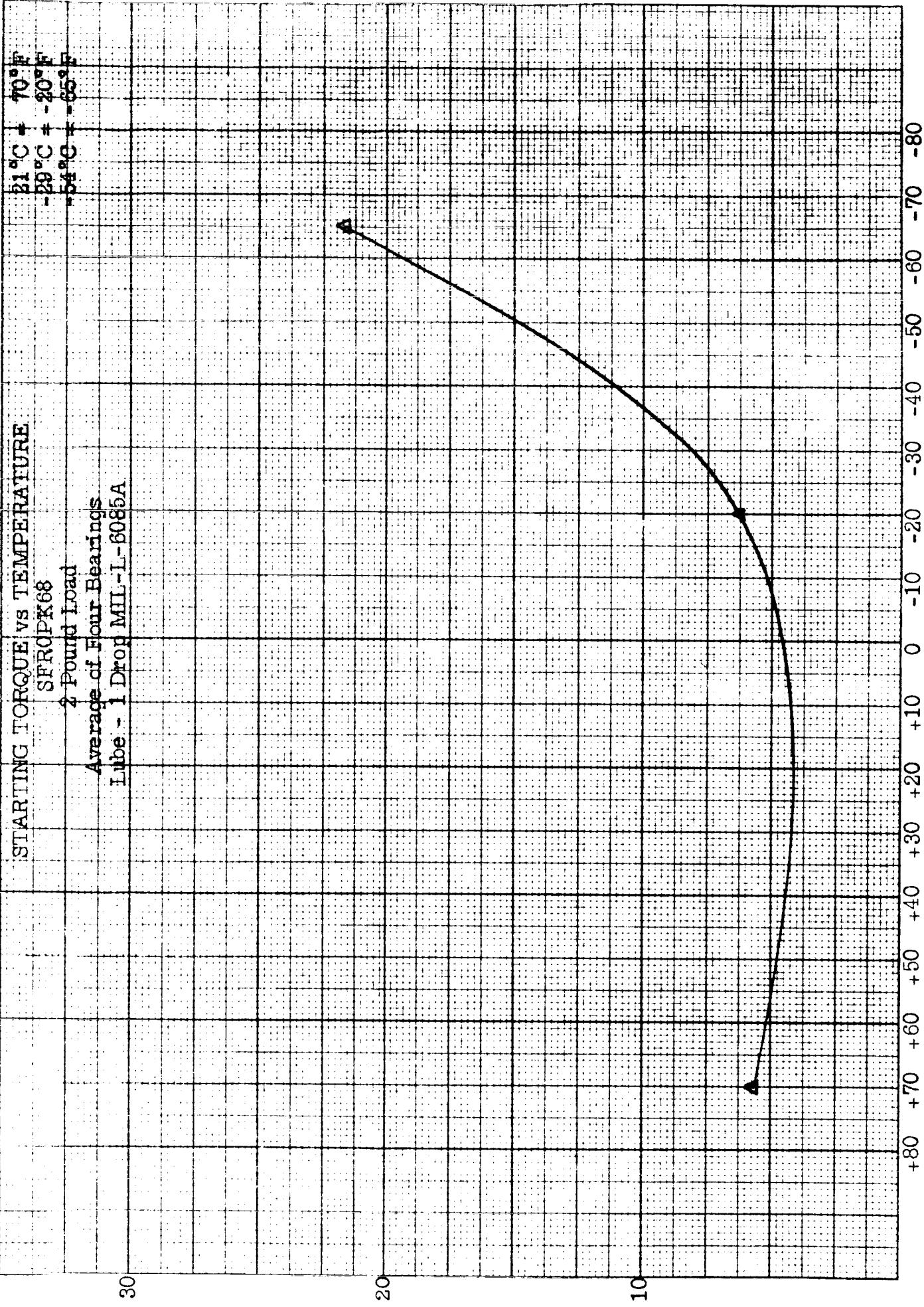
STARTING TORQUE vs TEMPERATURE

SFRQPK68

2 Pound Load

Average of Four Bearings

Lube - 1 Drop MIL-L-6085A



TORQUE vs SPEED at VARIOUS TEMPERATURES

SFR0PK68

2 Pound Load

Average of Four Bearings
Lube - 1 Drop MIL-L-6085A

21°C. 70°F.
-29°C. 20°F.
-54°C. 65°F.

70

60

50

40

30

20

10

0

TORQUE IN MCG

1000

3000

6000

10000

SPEED IN RPM

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR0PK68		1/2 Pound Load	Lube - 1 Drop MIL-L-6085A			
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10000 RPM
			70°F			
1	4,000		7,000	7,000	9,000	11,000
2	3,500		5,000	5,000	7,000	9,500
3	6,000		6,000	8,000	8,000	10,000
4	4,000		6,000	6,000	7,500	10,000
Avg.	4,375		6,000	6,500	7,875	10,125
			-20°F			
1	2,000		4,000	6,000	7,500	9,000
2	3,000		3,000	5,000	5,000	7,500
3	4,000		4,000	8,000	10,000	10,000
4	4,000		6,000	7,000	9,000	11,000
Avg.	3,250		4,250	6,500	7,875	9,375
			-65°F			
1	9,000		13,000	17,000	19,000	20,000
2	10,500		18,000	20,000	22,000	28,000
3	8,000		16,000	17,500	22,500	30,000
4	7,000		10,500	12,500	16,000	20,000
Avg.	8,625		14,375	16,750	19,875	24,500

Readings are in mgmm

TORQUE VALUES OF INDIVIDUAL BEARINGS

SF60PK68		1 Pound Load		Lube - 1 Drop MIL-L-6085A		
BRG. NO.	STARTING	1000 RPM	3000 RPM	6000 RPM	10000 RPM	
		70°F				
1	6,000	7,000	9,000	9,000	9,000	
2	3,500	5,000	5,000	7,000	9,500	
3	5,000	5,000	6,000	8,000	8,000	
4	4,000	6,000	6,000	7,500	7,500	
Avg.	4,625	5,750	6,500	7,875	8,500	
		-20°F				
1	4,000	4,000	6,000	6,000	11,000	
2	3,000	3,000	5,000	5,000	7,500	
3	2,000	4,000	8,000	10,000	10,000	
4	6,000	7,000	9,000	13,000	19,000	
Avg.	3,750	4,500	7,000	8,500	11,875	
		-65°F				
1	9,000	13,000	17,000	19,000	23,500	
2	10,500	24,000	28,000	30,000	38,000	
3	12,000	17,500	22,500	36,000	38,000	
4	12,500	14,000	20,000	29,000	37,000	
Avg.	11,000	17,125	21,875	28,500	34,125	

Readings are in mgmm

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR0PK68		2 Pound Load		Lube - 1 Drop MIL-L-6085A		
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10000 RPM
			70°F			
1	7,000		9,000	9,000	11,000	11,000
2	5,000		5,000	7,000	9,500	9,500
3	5,000		6,000	8,000	10,000	11,500
4	6,000		7,500	10,000	11,000	11,000
Avg.	5,750		6,875	8,500	10,375	10,750
			-20°F			
1	7,500		9,000	9,000	11,000	14,000
2	5,000		7,500	9,500	11,000	11,000
3	4,000		6,000	8,000	10,000	12,000
4	9,000		9,000	11,000	13,000	15,000
Avg.	6,375		7,875	9,375	11,250	13,000
			-65°F			
1	17,000		19,000	20,000	23,500	28,500
2	20,000		28,000	30,000	38,000	47,000
3	21,000		26,500	36,000	46,000	52,000
4	29,000		37,000	40,000	51,000	55,000
Avg.	21,750		27,625	31,500	39,625	45,625

Readings are in mgmm

STARTING TORQUE VS TEMPERATURE

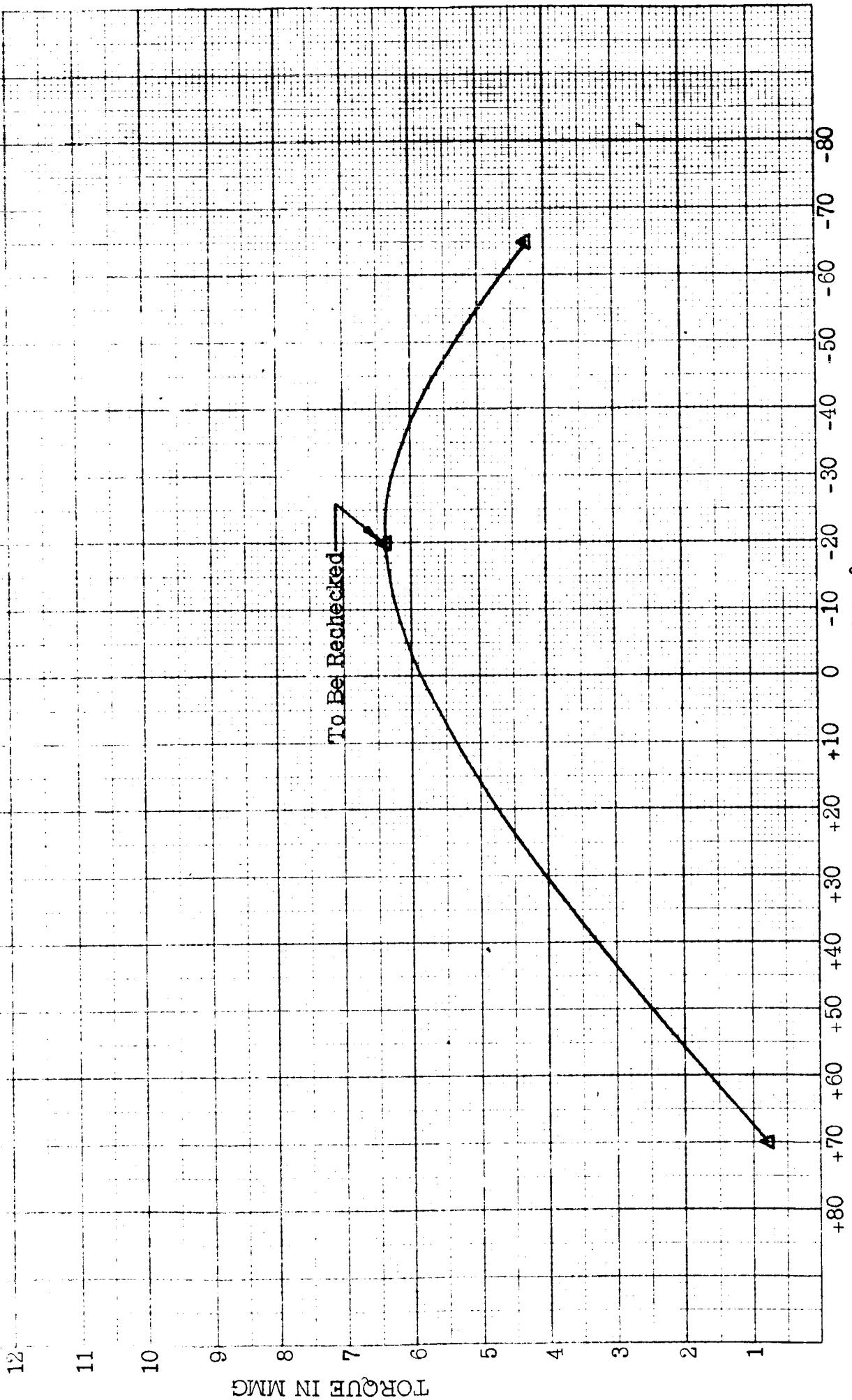
SFROPK68

Average of Four Bearings

Lube - 1 Drop of MIL-L-6085A Centrifuged

$21^{\circ}\text{C} = 70^{\circ}\text{F}$
 $-29^{\circ}\text{C} = -20^{\circ}\text{F}$
 $-54^{\circ}\text{C} = -65^{\circ}\text{F}$

Δ=75 g. load



TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR0PK68

MIL-L-6085A Centrifuged

Six Starts Per Bearing Under 75-Gram Load
Starts at 70°F

Brg. No.	1	2	3	4	5	6	Avg.
1							308
2							1284
3							316
4							972
							Average Total Torque of Four Bearings 720

at -20°F

1	8400	4480	3920	5600	9240	8400	6674
2	4240	3820	4480	8400	4240	3560	4790
3	3920	2820	2400	9240	7520	8400	5717
4	9000	8000	8400	6400	5600	7200	7434
							Average Total Torque of Four Bearings 6154

at -65°F

1	3000	3400	3600	3200	2400	5600	3534
2	3600	3000	4400	5800	2400	2360	3594
3	4800	3600	3400	4600	5800	3600	4300
4	5600	6760	6400	5800	5160	7600	6220
							Average Total Torque of Four Bearings 4412

Readings are in mgmm

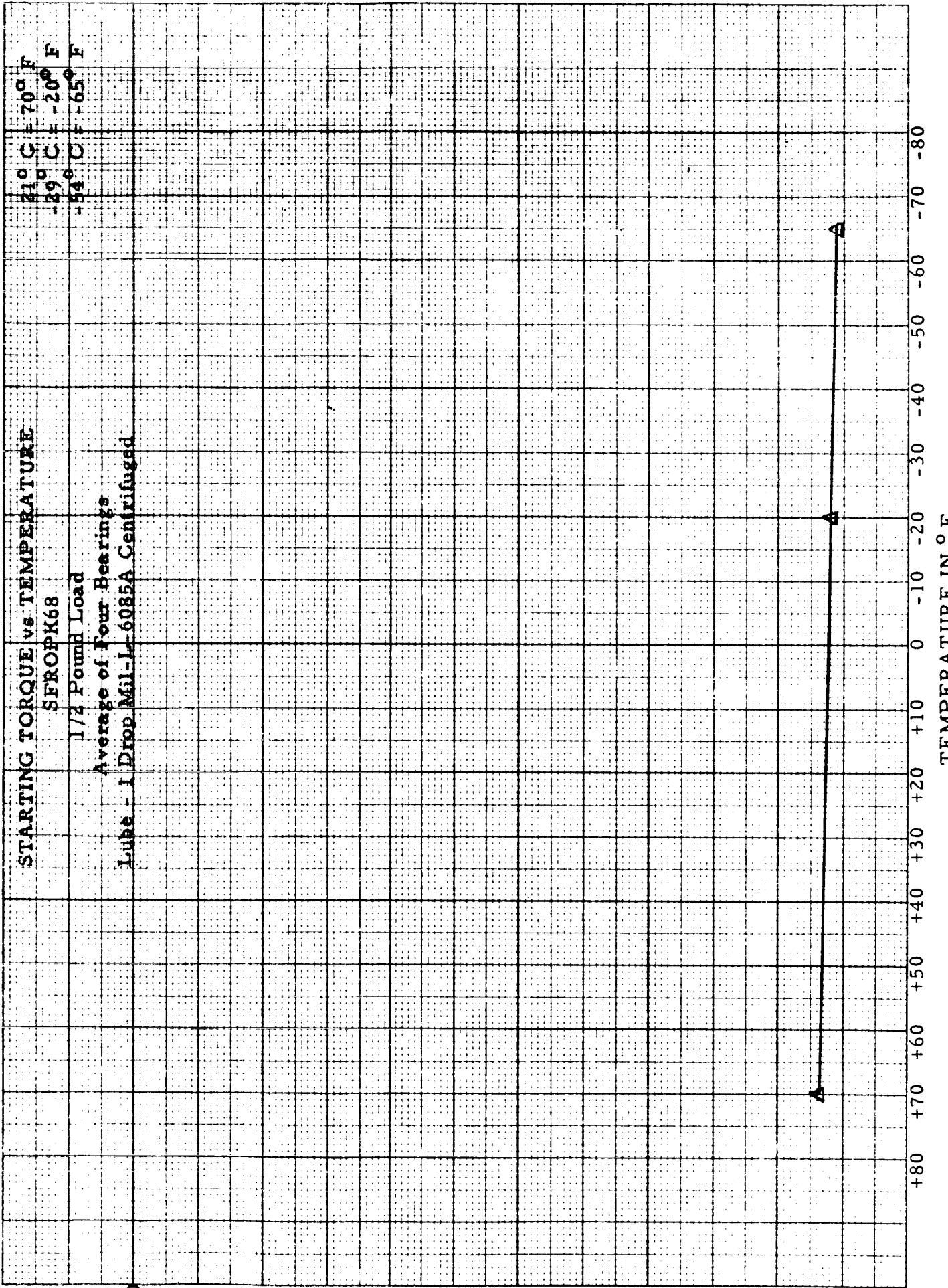
STARTING TORQUE vs TEMPERATURE

SEROPK68

1/2 Pound Load

Average of Four Bearings

Lube - 1 Drop Mil-1-6085A Centrifuged



TORQUE VS SPEED at VARIOUS TEMPERATURES

SFROPK68

1/2 Pound Load

Average of Four Bearings

Lube - MIL-L-6085A Centrifuged

21°C 70°F
-29°C -20°F
-54°C -65°F

50

40

30

20

10

TORQUE IN MMG

0

3000

1000

6000

10000

SPEED IN RPM

STARTING TORQUE vs TEMPERATURE

SFROPK68

1 Pound Load

Average of Four Bearings

Lube - 1 Drop Mill-1-6085A Centrifuged

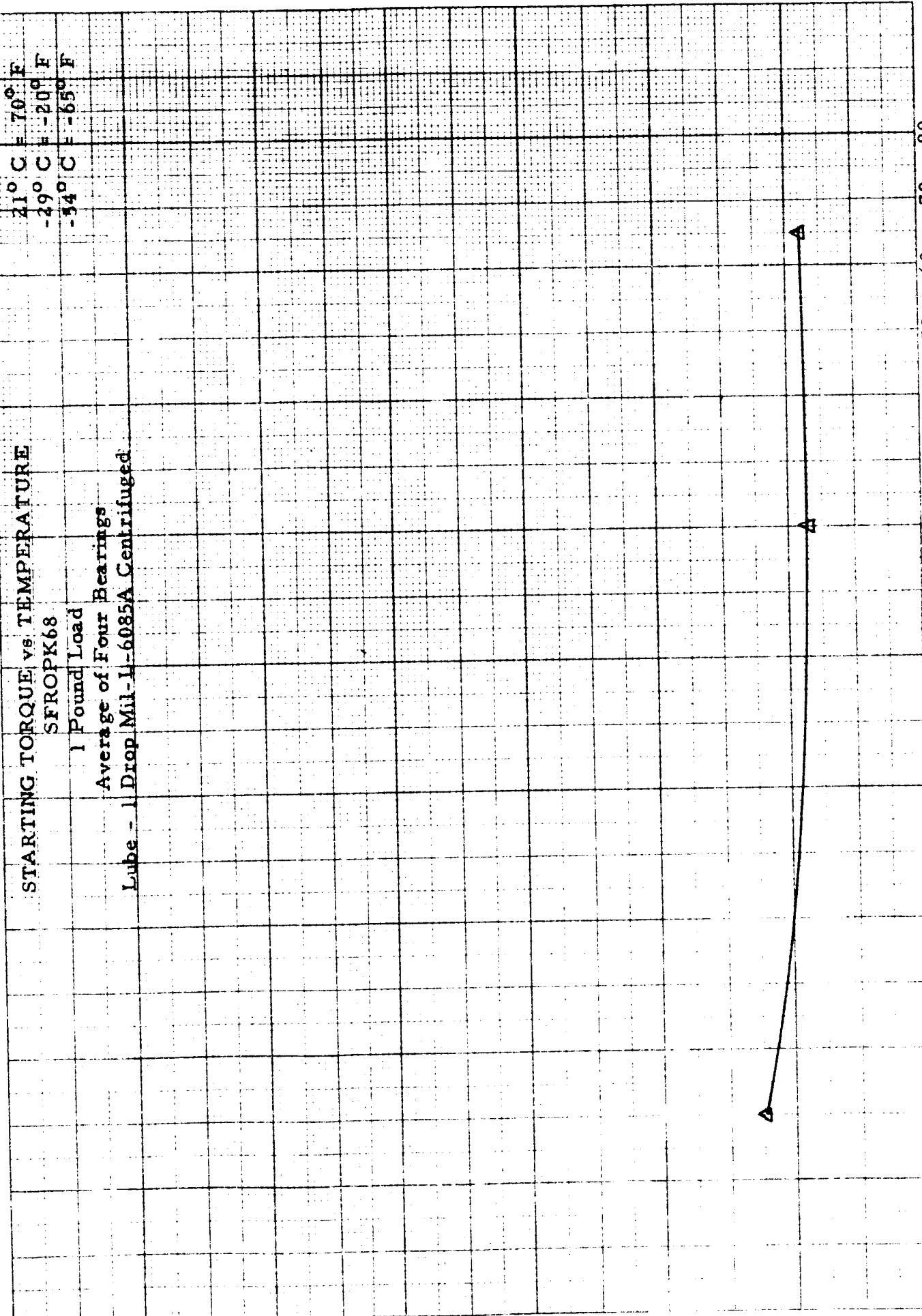
30

TORQUE IN MMG

20

10

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80
TEMPERATURE IN $^{\circ}$ F



TORQUE VS SPEED at VARIOUS TEMPERATURES

SFR0PK68

Front Load

Average of Four Bearings

Lube - MIL-L-60854 Centrifuged

70° E

21° C

-29° C

-54° C

-65° F

20° F

65° F

50

40

30

20

10

0

TORQUE IN MMG

1000

3000

6000

10000

SPEED IN RPM

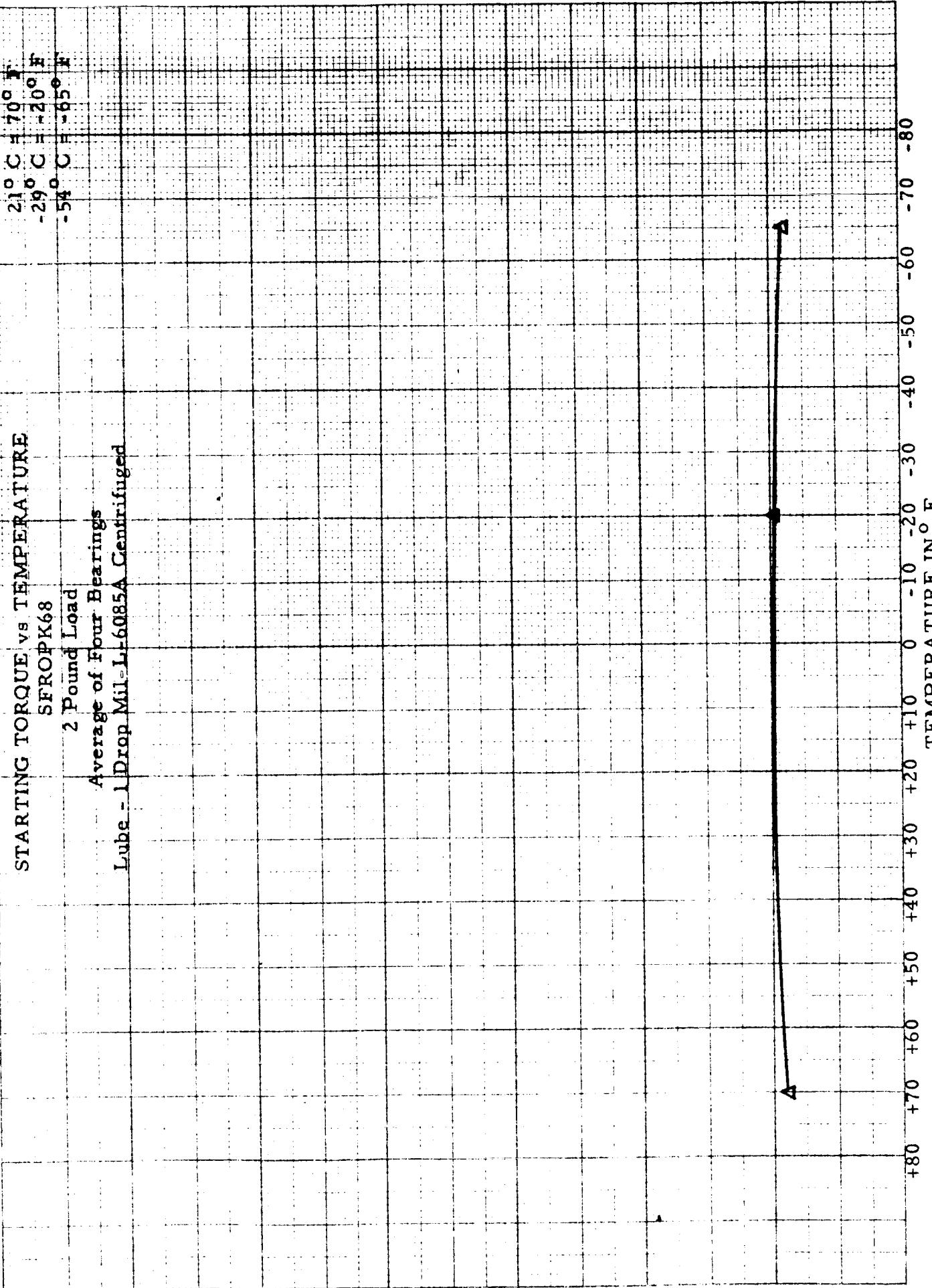
STARTING TORQUE vs TEMPERATURE

SFROPK68

2 Pound Load

Average of Four Bearings

Lube - 1 Drop Mil-L-6085A Centrifuged



TORQUE VS SPEED at VARIOUS TEMPERATURES

SFRQPK68

2 Pound Load

Average of Four Bearings

Tube - MIL-L-6085A Centrifuged

21°C 70°F

29°C 20°F

54°C 65°F

50

40

30

20

10

TORQUE IN MMG

0 10000

3000

6000

0 10000 SPEED IN RPM

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR0PK68		1/2 Pound Load	Lube - MIL-L-6085A Centrifuged			
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10000 RPM
			70°F			
1	4,000		6,000	7,500	7,500	9,000
2	1,500		3,500	5,500	5,500	7,500
3	4,500		6,000	8,000	10,000	10,000
4	4,000		4,000	6,000	7,500	9,000
Avg.	3,500		4,875	6,750	7,625	8,875
			-20°F			
1	4,000		6,000	6,000	7,500	9,000
2	3,500		3,500	5,500	5,500	7,500
3	500		2,000	4,000	4,000	6,000
4	4,000		4,000	6,000	8,000	9,500
Avg.	3,000		3,875	5,375	6,250	8,000
			-65°F			
1	2,000		4,000	4,000	6,000	7,500
2	3,500		5,500	7,000	7,000	9,000
3	4,000		6,500	6,500	8,500	10,000
4	2,000		4,000	4,000	6,000	8,000
Avg.	2,875		5,000	5,375	6,875	8,625

Readings are in mg-mm

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFROPKC8		1 Pound Load		Lube - MIL-L-6085A Centrifuged			
BRG. NO.	STARTING			1000 RPM	3000 RPM	6000 RPM	10000 RPM
				70°F			
1	6,000			7,500	9,000	9,000	11,000
2	5,500			7,500	9,500	11,000	13,500
3	6,000			6,000	8,000	10,000	11,500
4	7,500			7,500	9,000	9,000	11,000
Avg.	6,250			7,125	8,875	9,750	11,750
				-20°F			
1	6,000			7,500	9,000	11,000	11,000
2	3,500			5,500	5,500	7,500	9,500
3	4,000			6,000	6,000	8,000	10,000
4	4,000			4,000	6,000	8,000	9,500
Avg.	4,375			5,750	6,625	8,625	10,000
				-65°F			
1	2,000			4,000	6,000	6,000	9,000
2	5,500			5,500	7,000	7,000	9,000
3	6,500			8,500	10,000	10,000	12,000
4	4,000			4,000	6,000	8,000	8,000
Avg.	4,500			5,500	7,250	7,750	9,500

Readings are in mgmm

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR0PK68		2 Pound Load		Lube - MIL-L-6085A Centrifuged		
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10000 RPM
			70°F			
1	4,000		4,000	6,000	6,000	7,500
2	3,500		5,500	7,500	7,500	9,500
3	4,500		6,000	8,000	10,000	10,000
4	6,000		6,000	7,500	11,000	11,000
Avg.	4,500		5,375	7,250	8,625	9,500
			-20°F			
1	6,000		6,000	7,500	7,500	9,000
2	7,500		7,500	9,500	9,500	9,500
3	2,000		4,000	4,000	6,000	8,000
4	4,000		6,000	6,000	8,000	8,000
Avg.	4,875		5,875	6,750	7,750	8,625
			-65°F			
1	500		2,000	4,000	4,000	6,000
2	5,500		7,000	9,000	11,500	11,500
3	6,500		8,500	8,500	10,000	12,500
4	6,000		6,000	8,000	9,500	9,500
Avg.	4,625		5,875	7,375	8,750	9,750

Readings are in mgmm

NO. 1200 SEMI-SOLID GEAR
OIL FOR MOTOR CARS

SOCIETE FRANCAISE
BOSTON N.Y.
MAISON DE PARIS

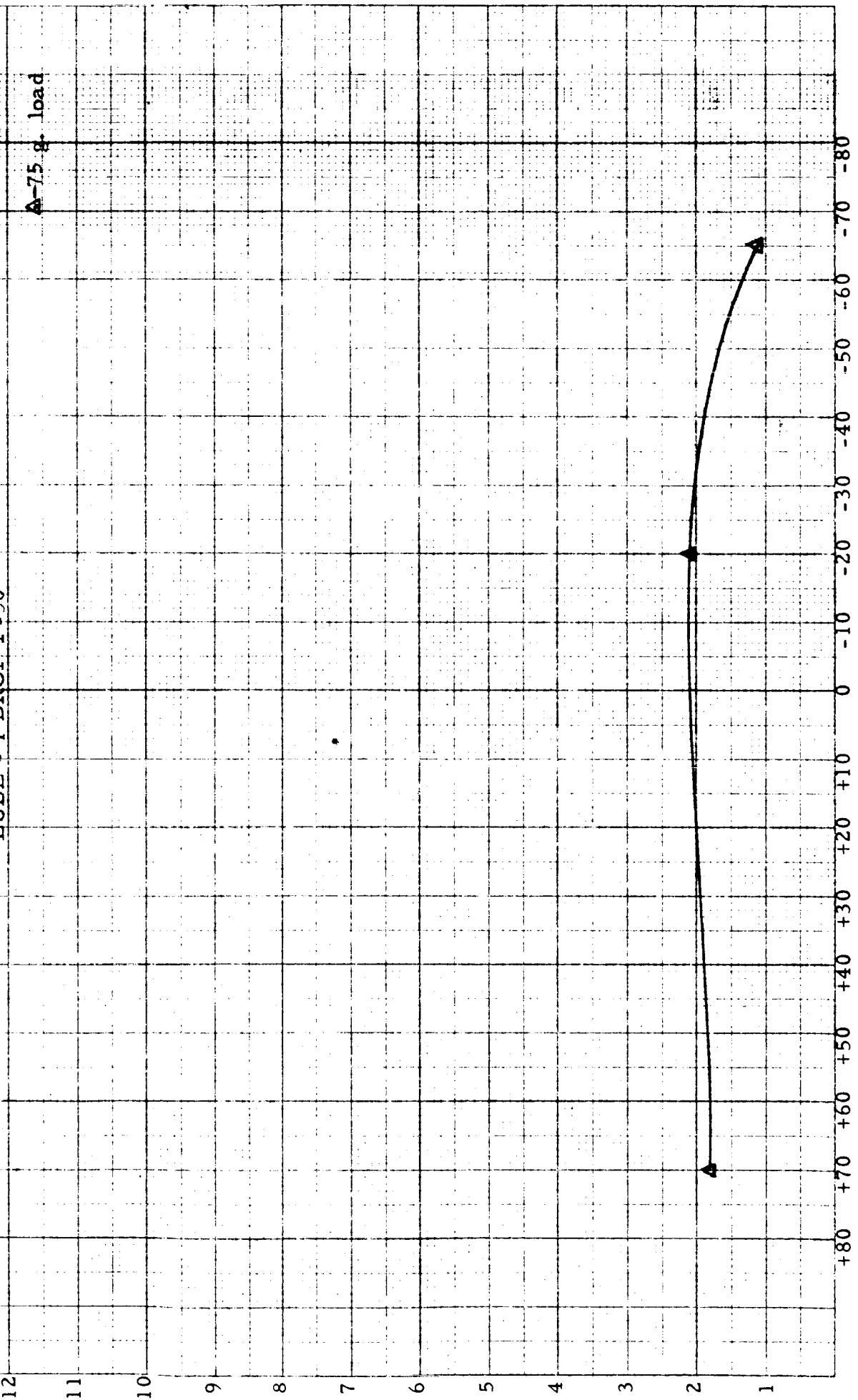
STARTING TORQUE vs. TEMPERATURE

SFRÖPK68

AVERAGE OF FOUR BEARINGS

LUBE - 1 DROP F.50

▲-75 g. load



TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR0PK68

1 Drop F-50

Six Starts Per Bearing Under 75-Gram Load

Starts at 70° F

Brg. No.	1	2	3	4	5	6	Avg.
1	1360	1560	1680	1680	1920	1920	1687
2	1560	1560	1680	1920	1920	2000	1773
3	1560	1560	1680	1920	2000	2200	1820
4	1680	1920	2000	2200	2200	2600	2100

Average Total Torque of Four Bearings 1845

at -20° F

1	1600	1680	2000	2000	2200	2400	1947
2	1680	2000	2200	2200	2400	2400	2147
3	1680	2000	2000	2200	2400	2480	2127
4	2000	2000	2200	2400	2400	2480	2247

Average Total Torque of Four Bearings 2117

at -65° F

1	800	1000	1000	1200	1280	1280	1093
2	1000	1200	1200	1280	1280	1280	1207
3	1000	1160	1200	1200	1280	1280	1187
4	1000	1000	1200	1200	1280	1280	1160

Average Total Torque of Four Bearings 1162

Readings are in mgm.

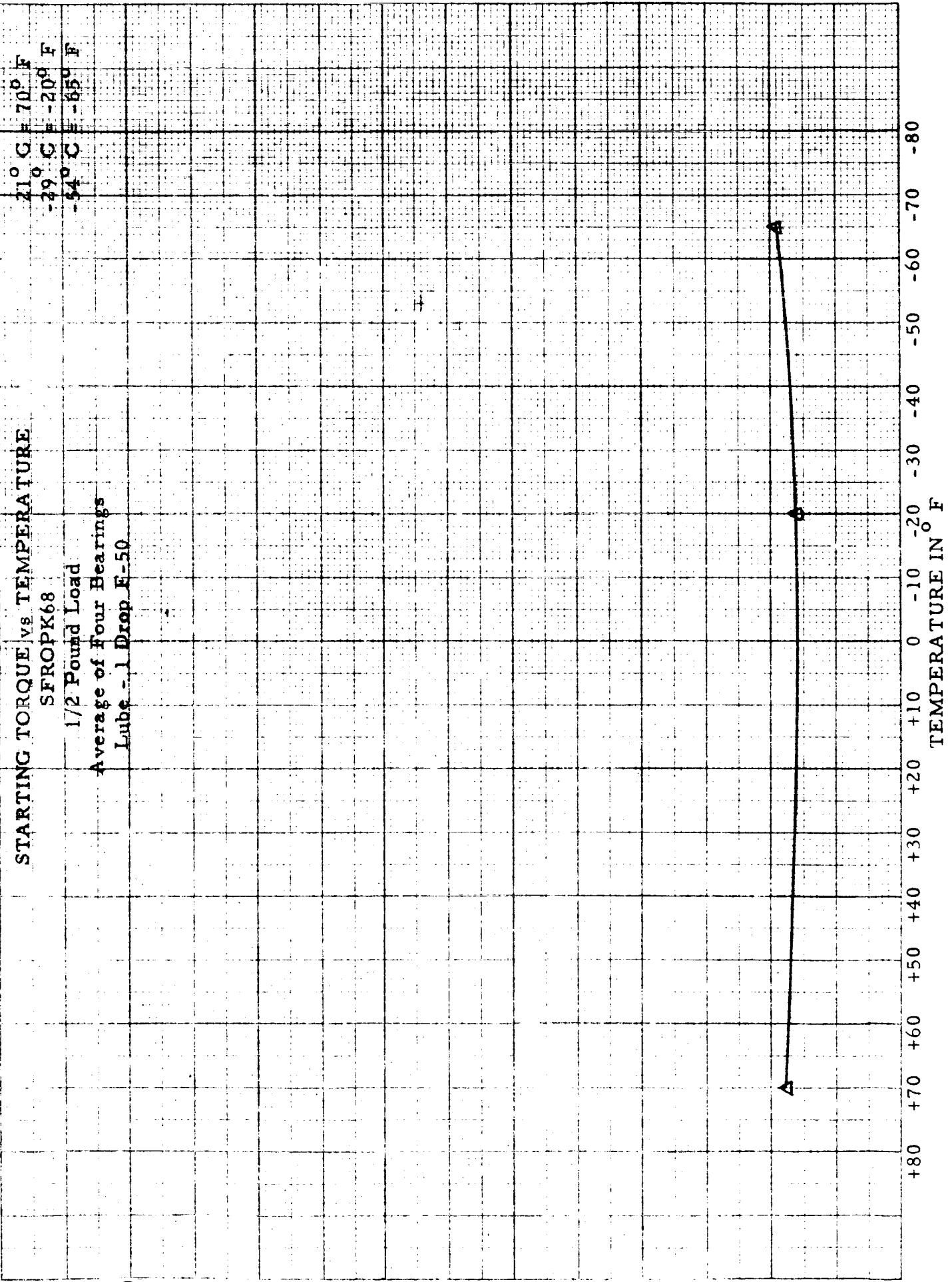
STARTING TORQUE vs TEMPERATURE

SFRPK68

1/2 Pound Load

Average of Four Bearings

Lube = 1 Drop E-50



TORQUE vs SPEED at VARIOUS TEMPERATURES

STROPK8

1/2 Pound Load

Average of Five Bearings

Lube - 1 drop F-50

-70° F - 21° C
-65° F - 29° C
-60° F - 34° C

TORQUE IN MMG

50

40

30

20

10

0

1000 3000 6000 10000

SPEED IN RPM

10000

STARTING TORQUE vs TEMPERATURE

SFR0PK68

1 Pound Load

Average of Four Bearings

Lube - 1 Drop F-50

30

20

10

TORQUE IN MG

21° C = 70° F

-29° C = -20° F

-54° C = -65° F

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80
TEMPERATURE IN ° F

TORQUE vs SPEED at VARIOUS TEMPERATURES

SEROPK68

1 POUND LOAD

Average of Four Bearings

1 tube - 1 drop H-50

70° R
20° F
85° E

21°C

29°C

54°C

50

40

30

20

10

0 1000 3000

6000 10000

SPEED IN RPM

TORQUE IN MCG

STARTING TORQUE vs TEMPERATURE

SFROPK68

2 Pound Load

Average of Four Bearings

Lube - 1 Drop F-50

30

20

TORQUE IN MMG

10

+80

+70

+60

+50

+40

+30

+20

+10

0

-10

-20

-30

-40

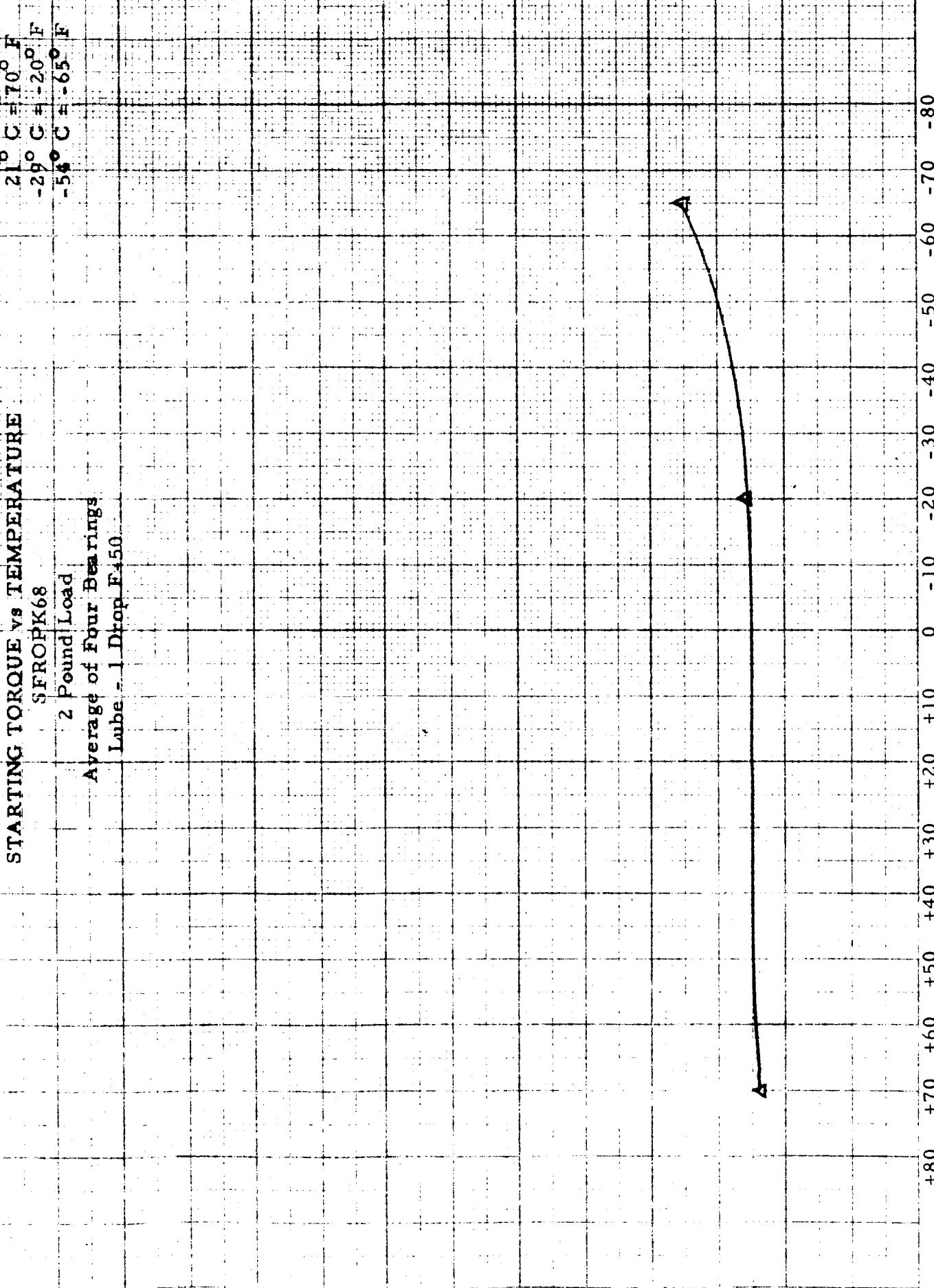
-50

-60

-70

-80

TEMPERATURE IN °F



TORQUE VS SPEED AT VARIOUS TEMPERATURES

SHROPSHIRE

220°F 1000

180°F 1000

140°F 1000

100°F 1000

60°F 1000

50

40

30

20

10

0

TORQUE IN MMG

0

1000

3000

6000

10000

SPEED IN RPM

TORQUE VALUES OF INDIVIDUAL BEARINGS.

SFR0PK68		1/2 Pound Load		Lube - 1 Drop F-50		
BRG. NO.	STARTING	1000 RPM	3000 RPM	6000 RPM	10000 RPM	
		70° F				
1	4,000	4,000	6,000	7,500	9,000	
2	5,000	5,000	7,000	9,000	11,000	
3	5,000	6,000	8,000	8,000	10,000	
4	4,000	5,500	5,500	7,500	9,500	
Avg.	4,500	5,125	6,625	8,000	9,875	
		-20° F				
1	6,000	6,000	7,500	7,500	9,000	
2	3,500	5,000	5,000	7,000	7,000	
3	2,000	2,000	4,500	4,500	6,000	
4	5,000	5,000	7,500	7,500	9,000	
Avg.	4,125	4,500	6,125	6,625	7,750	
		-65° F				
1	4,500	4,500	6,000	11,000	12,500	
2	4,000	4,000	6,000	9,000	11,000	
3	5,000	5,000	7,000	9,000	14,000	
4	6,000	6,000	9,000	11,000	12,500	
Avg.	4,875	4,875	7,000	10,000	12,500	

Readings are in mgmm

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR0PK68		1 Pound Load		Lube - 1 Drop F-50		
BRG. NO.	STARTING	1000 RPM	3000 RPM	6000 RPM	10000 RPM	
		70° F				
1	4,000	6,000	7,500	7,500	9,000	
2	5,000	5,000	7,000	9,000	9,000	
3	5,000	6,000	8,000	10,000	11,000	
4	4,000	5,500	5,500	7,500	9,500	
Avg.	4,500	5,625	7,000	8,500	9,625	
		-20° F				
1	7,500	7,500	9,000	11,000	11,000	
2	5,000	7,000	7,000	9,000	9,000	
3	2,500	2,500	4,500	4,500	6,000	
4	5,000	5,000	9,000	9,000	11,000	
Avg.	5,000	5,500	7,375	8,375	9,250	
		-65° F				
1	4,000	4,500	6,000	6,000	11,000	
2	6,000	11,000	12,500	14,500	16,000	
3	5,000	7,000	9,000	12,500	17,000	
4	9,000	11,000	14,000	16,000	18,000	
Avg.	6,000	8,375	10,375	12,250	15,500	

Readings are in mgm.m

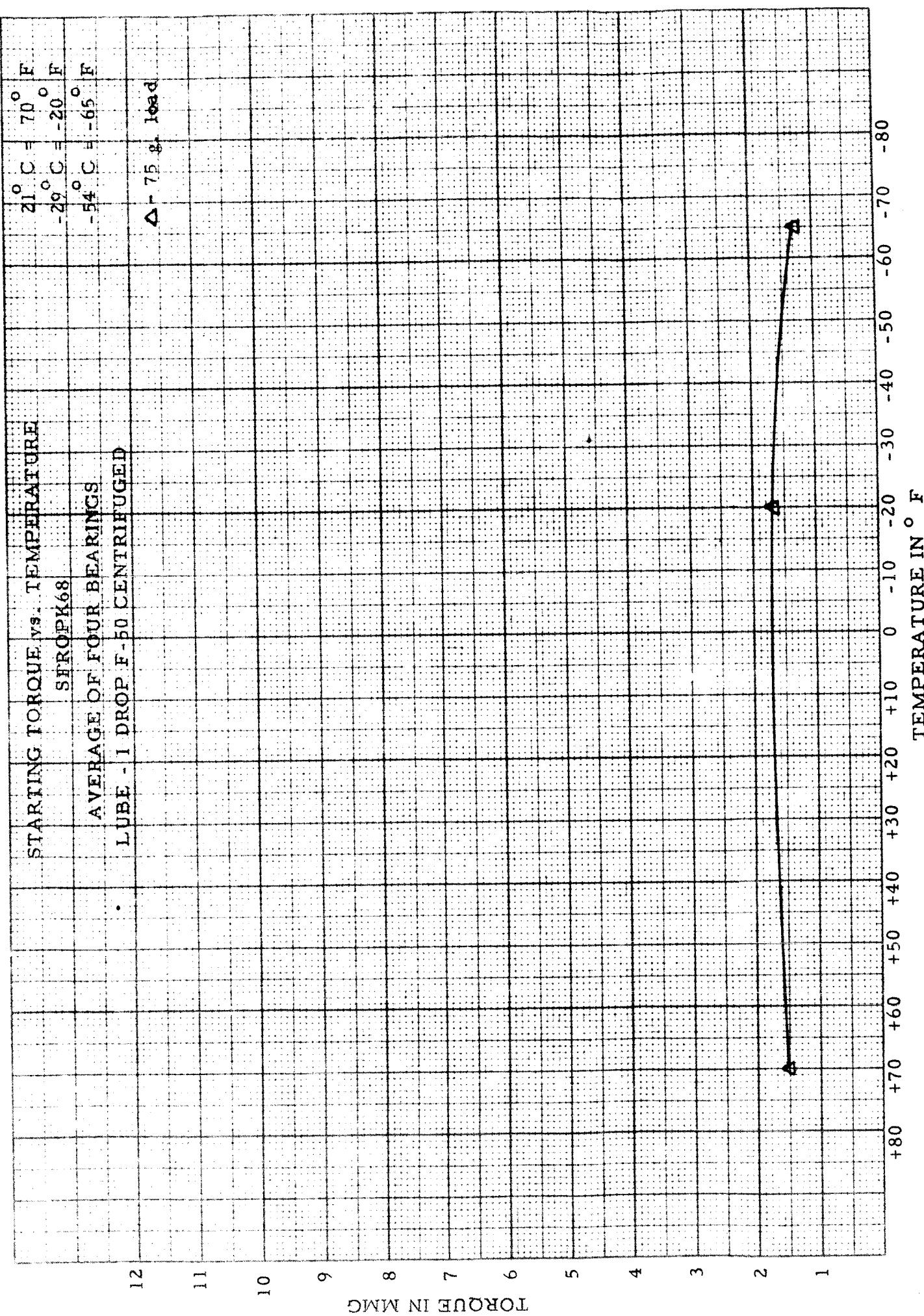


TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR0PK68		2 Pound Load		Lube - 1 Drop F-50			
BRG. NO.	STARTING			1000 RPM	3000 RPM	6000 RPM	10000 RPM
				70°F			
1	7,500			8,000	9,000	11,000	11,000
2	5,000			8,000	8,000	9,000	9,000
3	6,000			8,000	10,000	11,000	13,000
4	5,500			8,500	11,000	11,000	13,000
Avg.	6,000			8,625	9,500	10,500	11,500
				-20°F			
1	9,000			11,000	11,000	12,500	12,500
2	5,000			7,000	7,000	9,000	9,000
3	4,500			6,000	8,000	8,000	9,000
4	7,500			7,000	9,000	9,000	11,000
Avg.	6,500			7,750	8,750	9,625	10,375
				-65°F			
1	4,500			6,000	11,000	11,000	15,000
2	9,000			14,500	16,000	17,000	18,000
3	11,000			17,000	21,000	25,000	28,000
4	11,000			12,500	16,000	19,000	21,000
Avg.	8,875			12,500	16,000	18,000	20,500

Readings are in mgmm





TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR0PK68

F-50 Centrifuged

**Six Starts Per Bearing Under 75-Gram Load
Starts at 70° F**

Brg. No.	1	2	3	4	5	6	Avg.
1	800	800	800	1000	1000	1000	900
2	1560	1560	1920	2000	2080	2400	1920
3	1360	1680	1680	1920	1920	2000	1760
4	1000	1200	1360	1560	1680	1920	1453
				Average Total Torque of Four Bearings			1508

at -20° F

1	1160	1400	1600	2000	2000	2200	1727
2	1200	1400	1560	1680	1680	2000	1567
3	1200	1560	1600	1680	1680	2000	1620
4	1400	1560	1600	2000	2200	2400	1860
				Average Total Torque of Four Bearings			1693

at -65° F

1	800	1160	1280	1280	1560	1560	1273
2	1000	1160	1280	1560	1600	1600	1367
3	1160	1200	1280	1280	1600	1600	1353
4	800	1000	1200	1280	1560	1560	1233
				Average Total Torque of Four Bearings			1306

Readings are in mgmm

STARTING TORQUE vs TEMPERATURE

SFROPK68

1/2 Pound Load

Average of Four Bearings

Lube - 1 Drop F-50 Centrifuged

30

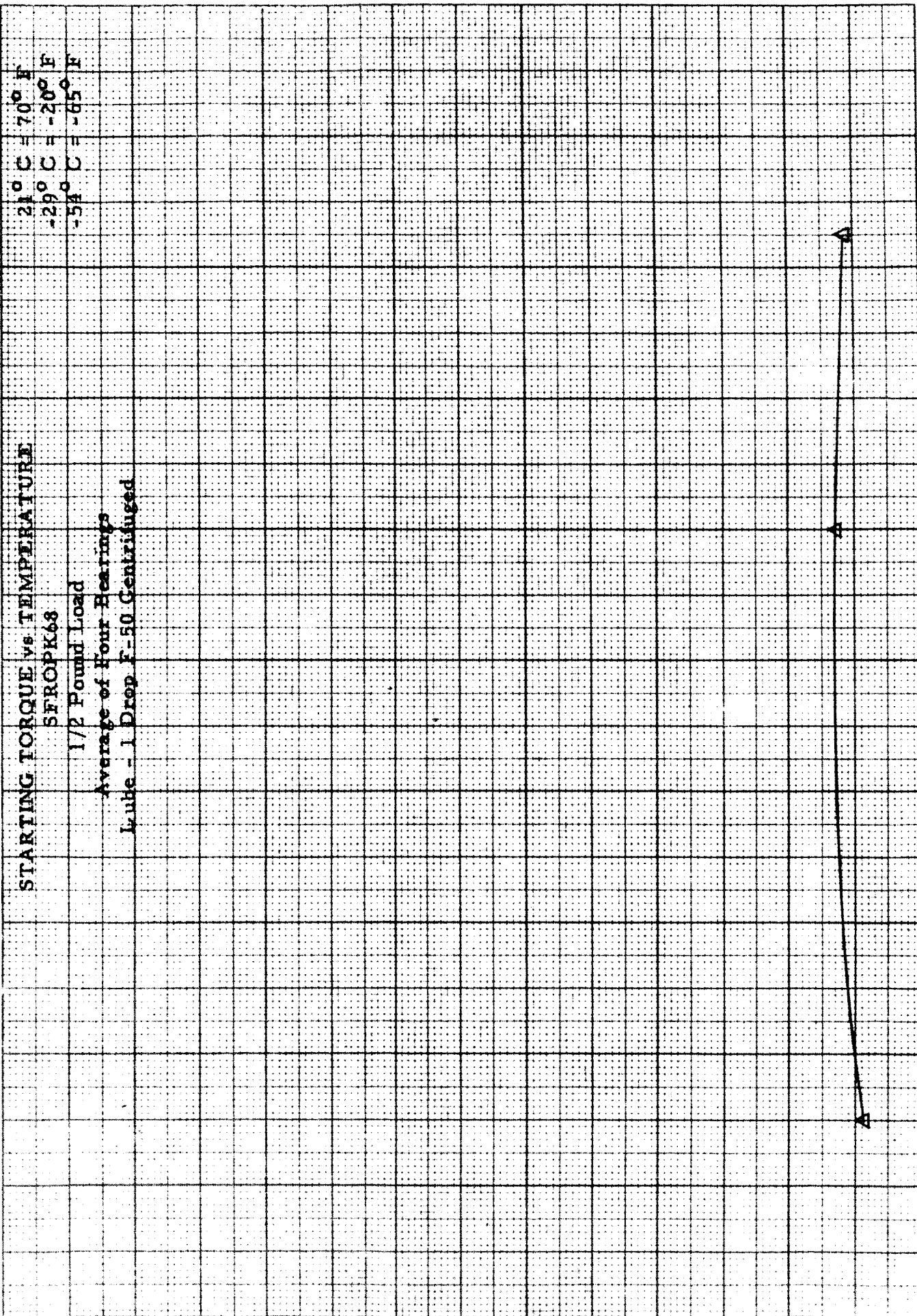
TORQUE IN MMG

20

10

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80

TEMPERATURE IN ° F



TORQUE vs SPEED at VARIOUS TEMPERATURES

SFROPK68

1/2 Pound Load

Average of Four Bearings

Lube - 1 Drop F-50 Centrifuged

21°C Δ 70°F
-29°C - + 20°F
-54°C - E 65°F

50

40

30

20

10

0

TORQUE IN MMG

10000

3000

6000

10000

STARTING TORQUE vs TEMPERATURE

SFROPK68

1 Pound Load

Average of Four Bearings

Lube - 1 Drop F-50 Centimeter

30

+70°C = 70°F

-29°C = -20°F

-34°C = -65°F

20

TORQUE IN MMG

10

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80
TEMPERATURE IN ° F



TORQUE vs SPEED at VARIOUS TEMPERATURES

SPROPKES

1 Pound Load

Average of Four Bearings

Lube - 1 Drop F-50 Centrifiged

21°C 70°F
-39°C 20°F
-54°C 65°F

50

40

30

20

10

0

TORQUE IN MCG

1000

3000

6000

10000

SPEED IN RPM

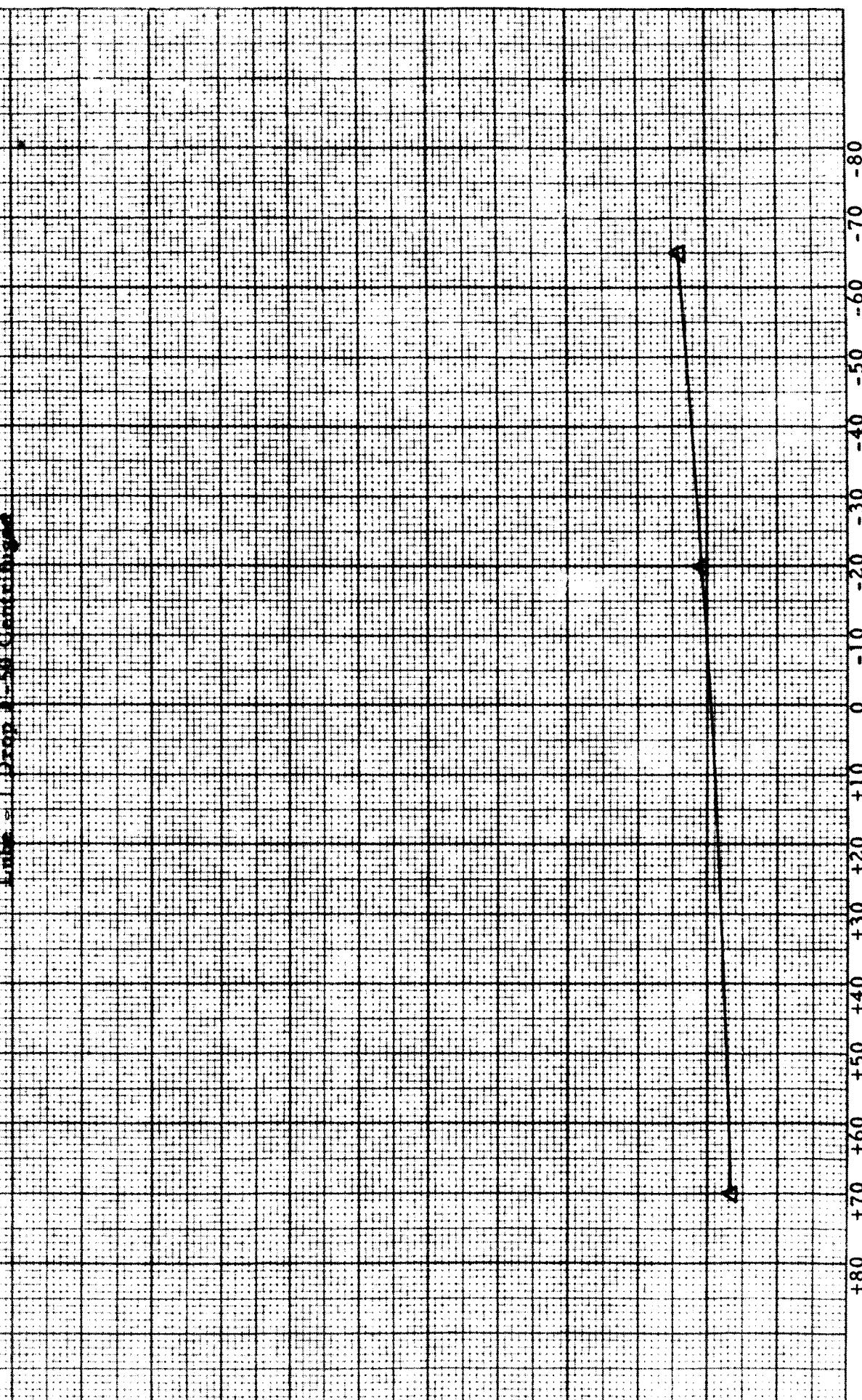
STARTING TORQUE vs TEMPERATURE

STROPK68

2 Pound Load

Average of Four Bearings
Line = 1.1 Diam. 1.56 Gage Length

30



20

10

TORQUE vs. SPEED at VARIOUS TEMPERATURES

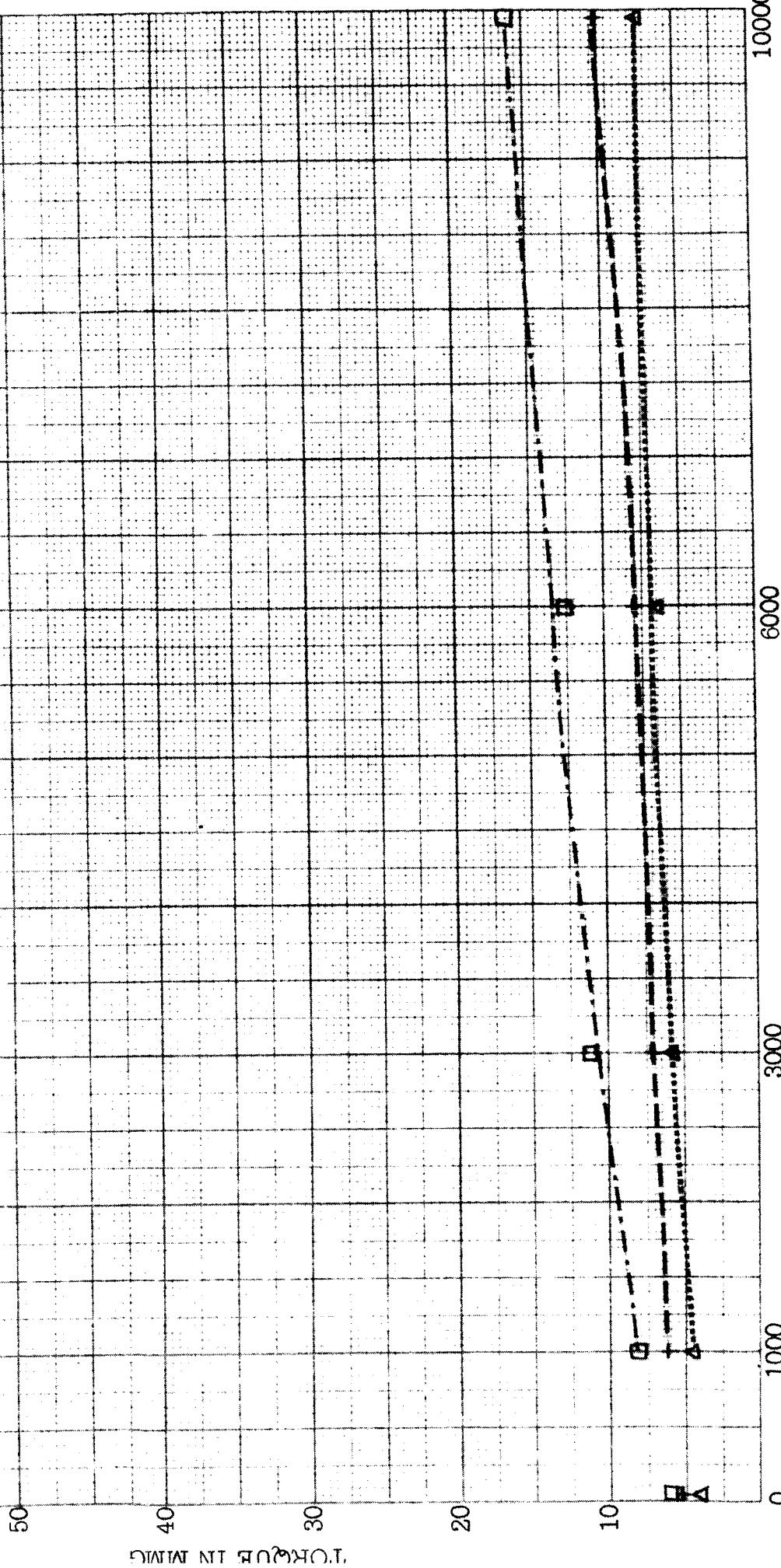
SFROPK68

2 Pound Load

Average of Four Bearings

Lube - 1 Drop F-50 Centrifuged

70° F
21°C
29°C
-34°C
-20°F
-65°F



TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR0PK68		1/2 Pound Load		Lube - 1 Drop F-50 Centrifuged		
BRG. NO.	STARTING	1000 RPM	3000 RPM	6000 RPM	10000 RPM	
		70°F				
1	3,000	4,000	5,000	5,500	5,500	
2	3,000	4,000	4,000	4,500	4,500	
3	2,000	3,000	4,000	4,000	4,000	
4	1,000	2,000	3,000	3,000	4,000	
Avg.	2,250	3,250	4,000	4,250	4,500	
		-20°F				
1	3,000	3,000	4,000	5,000	5,000	
2	4,000	4,000	5,000	5,500	5,500	
3	3,000	3,000	4,000	5,000	6,000	
4	3,000	4,000	5,000	5,000	5,500	
Avg.	3,250	3,500	4,500	5,125	5,500	
		-65°F				
1	3,200	3,600	6,600	9,400	11,000	
2	3,200	3,600	4,400	5,800	6,600	
3	3,000	4,000	4,500	5,500	5,500	
4	2,000	3,000	4,000	5,000	6,000	
Avg.	2,850	3,550	4,875	6,425	7,275	

Readings are in mNm

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR0PK68		1 Pound Load		Lube - 1 Drop F-50 Centrifuged		
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10000 RPM
			70°F			
1	3,000		3,000	4,000	4,000	5,000
2	3,000		3,000	4,000	4,500	6,000
3	2,000		3,000	3,000	4,000	5,000
4	2,000		3,000	4,000	4,500	5,500
Avg.	2,500		3,000	3,750	4,250	5,375
			-20°F			
1	4,000		5,000	6,500	8,500	9,000
2	4,000		5,000	5,500	6,500	8,000
3	5,000		6,000	7,000	8,000	9,500
4	4,000		5,000	5,000	5,500	7,500
Avg.	4,250		5,250	6,000	7,125	8,500
			-65°F			
1	3,600		7,400	8,800	10,200	11,800
2	4,100		7,400	8,000	8,800	10,200
3	4,000		4,500	5,500	5,500	7,500
4	3,000		4,000	5,000	6,000	8,000
Avg.	3,750		5,825	6,825	7,625	9,375

Readings are in mNm

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFRCPK68		2 Pound Load		Lube - 1 Drop F-50 Centrifuged		
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10000 RPM
			70°F			
1	5,000		5,000	5,500	6,500	7,500
2	4,000		4,500	6,000	6,500	7,500
3	4,000		5,000	6,000	7,000	7,000
4	4,000		4,500	5,500	6,500	8,000
Avg.	4,250		4,750	5,750	6,625	7,500
			-20°F			
1	5,000		5,000	6,000	7,500	9,000
2	5,500		9,000	9,000	10,000	14,000
3	5,000		6,000	6,000	7,000	8,500
4	5,500		6,500	7,500	8,000	9,000
Avg.	5,250		6,625	7,125	8,125	10,125
			-65°F			
1	8,800		13,200	13,800	16,000	23,400
2	5,800		8,800	18,200	19,800	23,400
3	4,500		5,500	6,500	7,500	8,500
4	5,000		6,000	7,000	8,000	9,000
Avg.	6,025		8,375	11,375	12,825	16,075
			Readings are in mg-mm			

STARTING TORQUE vs. TEMPERATURE

SER. FPK 68

AVERAGE OF FOUR BEARINGS

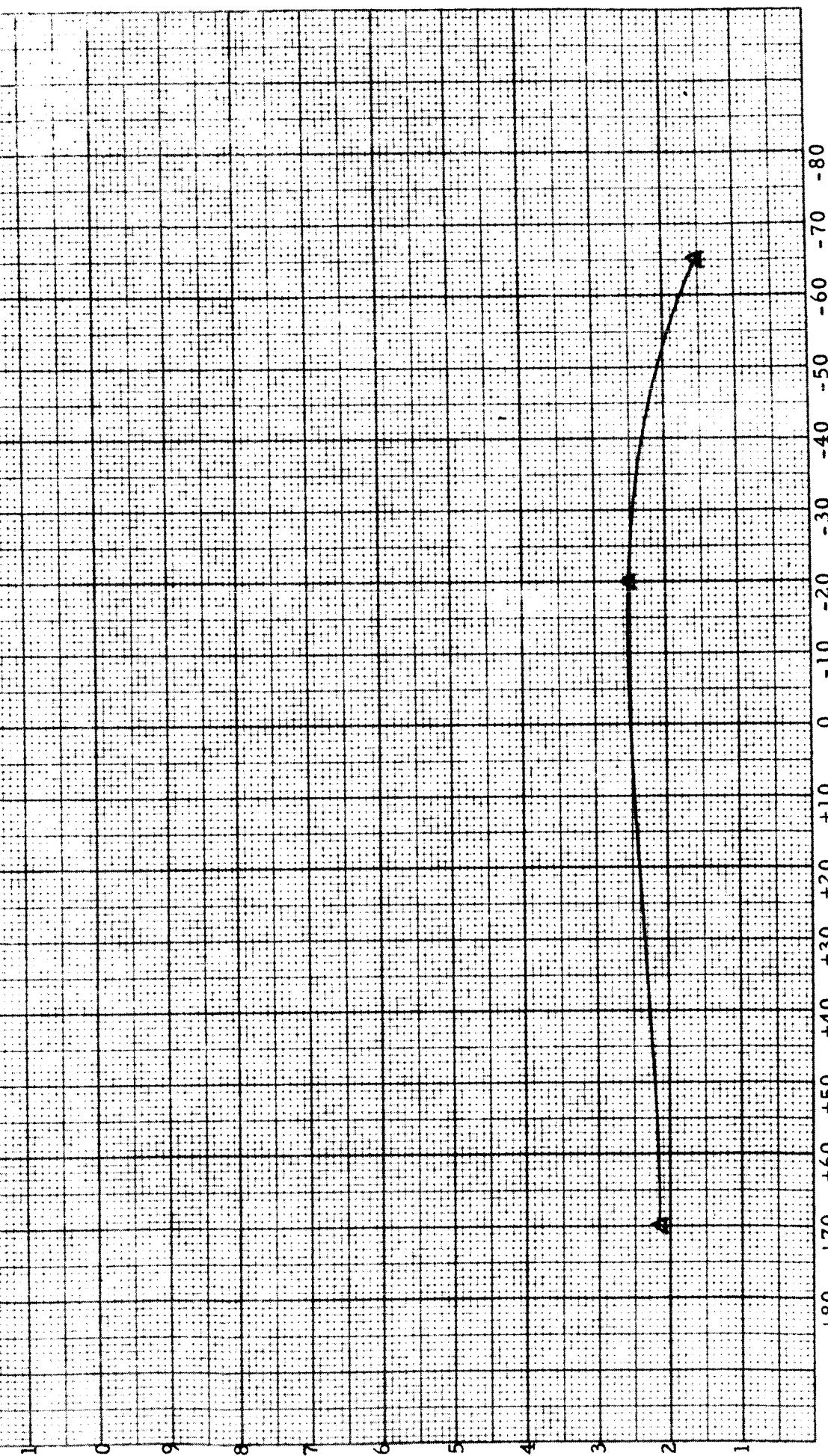
LUBE - 1 DROP MIL. L. 6085A

Δ - 75 E. load

12

10

TORQUE IN MMG



TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR1PPK68

1 Drop MIL-L-6085A

Six Starts Per Bearing Under 75-Gram Load
Starts at 70°F

Brg. No.	1	2	3	4	5	6	Avg.
1	1360	1360	1680	2000	2600	2800	1967
2	1680	1680	2000	2000	2200	2200	1960
3	1680	2400	2400	2600	2600	2800	2413
4	2000	2000	2200	2600	2600	2800	2367

Average Total Torque of Four Bearings 2177

at -20°F

1	2000	2200	2480	2480	2760	2760	2447
2	2200	2200	2400	2760	2760	2880	2534
3	2200	2400	2480	2480	2760	2760	2514
4	2400	2400	2760	2760	2760	2880	2660

Average Total Torque of Four Bearings 2539

at -65°F

1	1200	1280	1560	1600	1680	1800	1520
2	1200	1280	1280	1600	1600	1680	1440
3	1280	1560	1600	1680	1680	1800	1600
4	1200	1600	1680	1680	1800	1800	1627

Average Total Torque of Four Bearings 1547

Readings are in mgmm

STARTING TORQUE VS TEMPERATURE

SFRIPK68

1/2 Pound Load

Average of Four Bearings

Tube - 1 Drop Mill - L-8086A

21°C = 70°F
-28°C = -20°F
-54°C = -65°F

30

TORQUE IN MCG

10

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80
TEMPERATURE IN °F

TORQUE VS SPEED at VARIOUS TEMPERATURES

SFR1PPK68

1/2 Pound Load

Average of Four Bearings
Lube - 1 Drop MIL-L-6085A

21°C 70°F
29°C 85°F
54°C 130°F

70

60

50

40

30

20

10

1000

3000

5000

10000

TORQUE IN MCG

STARTING TORQUE vs TEMPERATURE

SFR1PK68

1 Pound Load

Average of Four Bearings

Line - 1 Drop MIL-L-6085A

$$21^{\circ}\text{C} = 70^{\circ}\text{F}$$

$$-28^{\circ}\text{C} = -20^{\circ}\text{F}$$

$$-54^{\circ}\text{C} = -65^{\circ}\text{F}$$

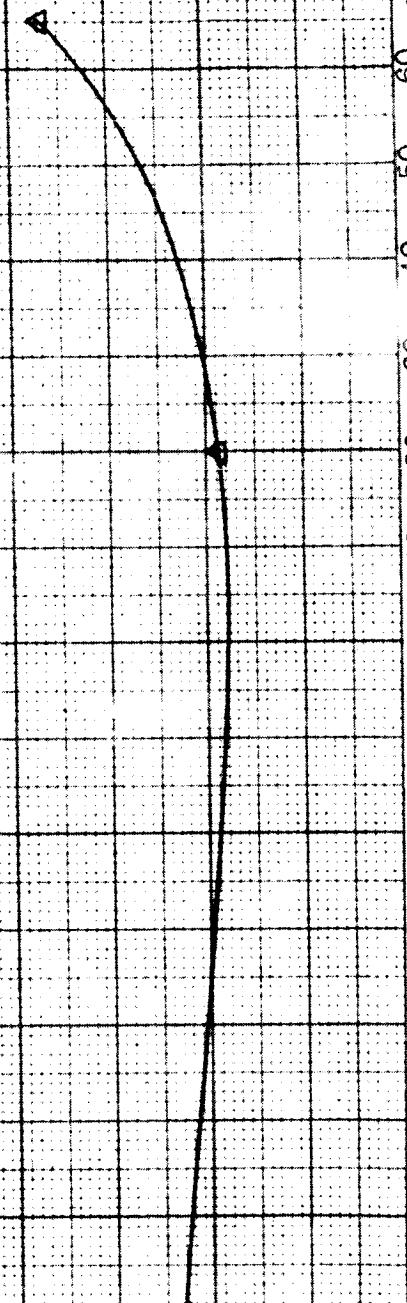
TORQUE IN MG

20

10

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80

TEMPERATURE IN $^{\circ}\text{F}$



30

TORQUE vs SPEED at VARIOUS TEMPERATURES

SFR1PPK68

1 Pound Load

Average of Four Bearings

Lube = 1 Drop MIL-L-6085A

21°C 70°F
29°C 20°F
54°C 65°F

70

60

50

40

30

20

10

4

TORQUE IN MMG

1000 3000 5000 7000 9000 10000

SPR.FD IN RPM

10000

SPALDING WORKS VS. TEMPERATURE
STRENGTH TEST
1/4 Pound Test
Average of Four Tests
Date - 1 Dec 1944
No. 1 Diamond

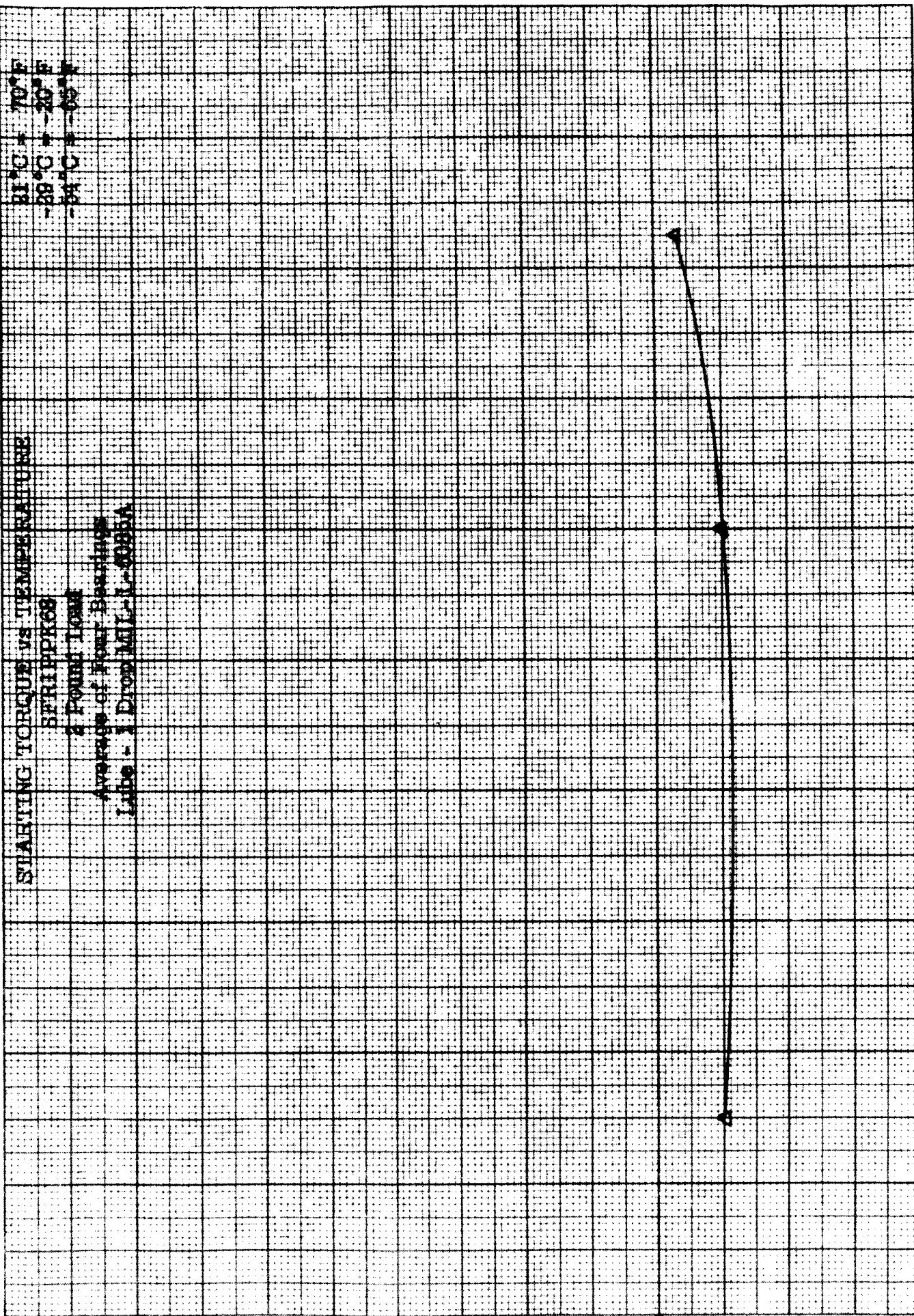
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TORQUE IN MMG

20

10

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80
TEMPERATURE IN °F



TORQUE vs SPEED at VARIOUS TEMPERATURES

SFR1PPK68

2 Pound Load

Average of Four Bearings
Lube - 1 Drop MIL-L-6085A

21°C 70°F
29°C 20°F
54°C 65°F

70

60

50

40

30

20

10

TORQUE IN MMG

0

3000

6000

10000

STRENGTH IN PDM

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR1PPK68		1/2 Pound Load	Lube - 1 drop Mil-L-6085A			
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10,000 RPM
			70° F			
1	6,000		7,500	11,000	12,500	12,500
2	5,000		7,000	7,000	9,000	11,000
3	8,000		10,000	10,000	11,500	11,500
4	4,000		6,000	6,000	7,500	9,500
Avg.	5,750		7,625	8,500	10,125	11,125
			-20° F			
1	6,000		6,000	7,000	9,000	11,000
2	5,000		7,500	7,500	9,000	9,000
3	6,000		6,000	8,000	8,000	10,000
4	6,000		7,500	9,500	9,500	13,000
Avg.	5,750		6,750	8,000	8,875	10,750
			-65° F			
1	13,000		15,000	16,500	16,500	20,000
2	15,000		18,000	20,000	22,000	22,000
3	12,000		17,500	21,000	28,000	32,000
4	10,500		12,500	12,500	14,500	18,000
Avg.	12,625		15,750	17,500	20,250	23,000

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR1PPK68		1 Pound Load	Lube - 1 Drop Mil-L-6085A			
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10,000 RPM
			70° F			
1	6,000		9,000	9,000	11,000	11,000
2	3,500		5,000	7,000	7,000	9,000
3	8,000		10,000	10,000	11,500	13,500
4	6,000		6,000	7,500	9,500	9,500
Avg.	5,875		7,500	8,375	9,750	10,750
			-20° F			
1	6,000		9,000	11,000	12,500	14,500
2	5,000		7,500	7,500	9,000	11,000
3	2,000		4,000	6,000	6,000	8,000
4	6,000		7,500	9,500	11,500	13,000
Avg.	4,750		7,000	8,500	9,750	11,625
			-65° F			
1	11,000		20,000	21,500	23,500	28,500
2	6,500		9,000	10,500	12,000	15,000
3	10,500		12,000	16,000	17,500	21,000
4	9,000		10,500	10,500	12,500	16,000
Avg.	9,250		12,875	14,625	16,375	20,125

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR1PPK68		2 Pound Load	Lube - 1 Drop Mil-L-6085A			
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10,000 RPM
			70° F			
1	7,500		9,000	9,000	11,000	11,000
2	5,000		7,000	7,000	9,000	9,000
3	8,000		10,000	10,000	11,500	13,500
4	9,500		11,000	13,000	13,000	15,000
Avg.	7,500		9,250	9,750	11,125	12,125
			-20° F			
1	11,000		14,500	16,000	16,000	18,000
2	7,500		9,000	11,000	11,000	13,500
3	6,000		6,000	8,000	8,000	10,000
4	6,000		7,500	9,500	11,500	13,000
Avg.	7,625		9,250	11,125	11,625	13,625
			-65° F			
1	13,000		16,500	20,000	25,000	28,500
2	10,500		15,000	16,500	18,000	18,000
3	6,500		10,500	12,000	16,000	17,500
4	7,000		9,000	10,500	12,500	16,000
Avg.	9,250		12,750	14,750	17,875	20,000
			Readings are in mgmm			

STARTING TORQUE vs TEMPERATURE

SFR1PPK68

Average of Four Bearings

Lube - 1 Drop of MIL-L-6085A Centrifuged

▲ - 75 g. load

12

11

10

9

8

7

6

5

4

3

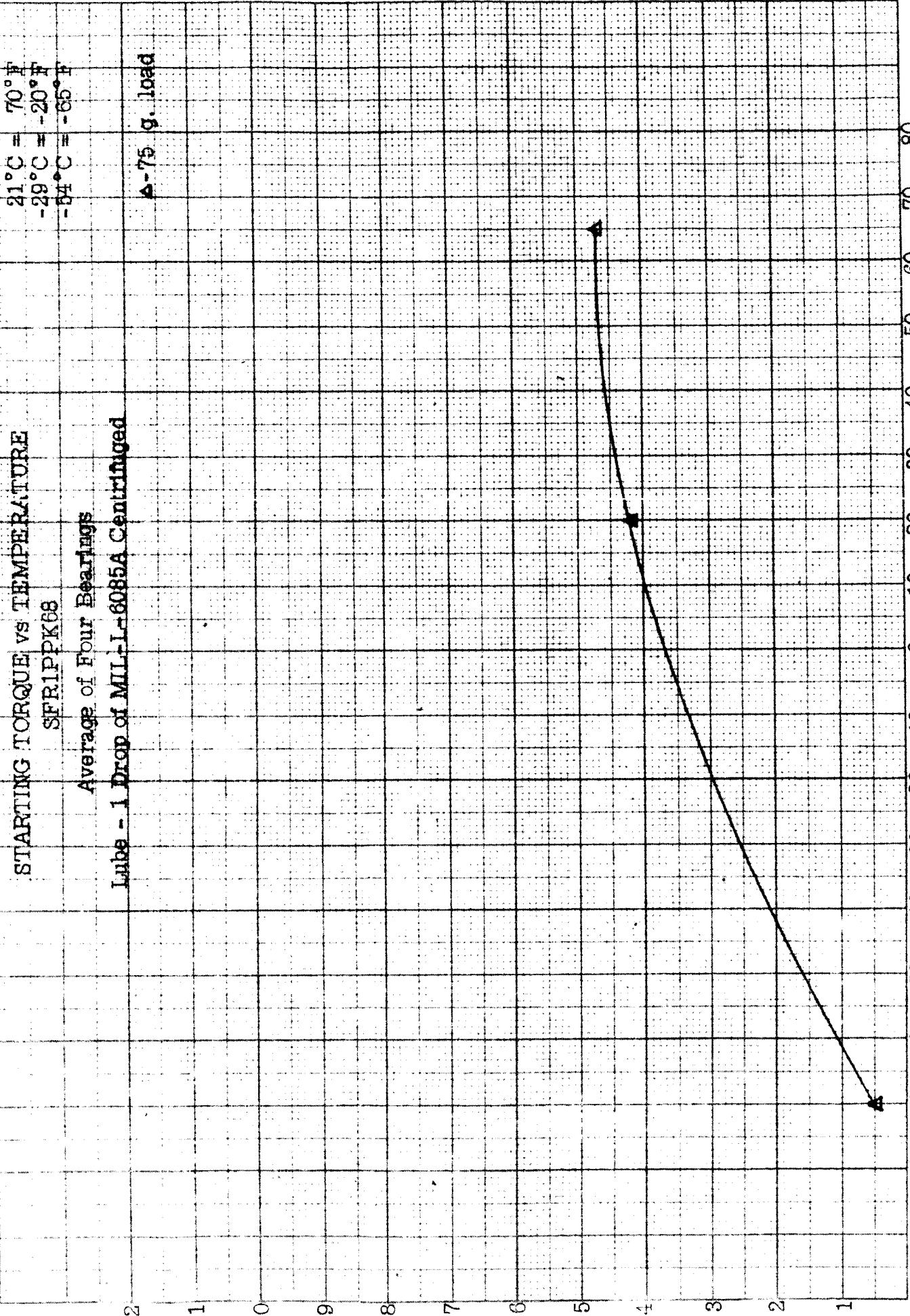
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1

TORQUE IN MG

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80

TEMPERATURE IN °F



TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR1PPK68
 MIL-I-6085A Centrifuged
 Six Starts Per Bearing Under 75-Gram Load
 Starts at 70° F

Brg. No.	1	2	3	4	5	6	Avg.
1							472
2							632
3							512
4							572
	Average Total Torque of Four Bearings						547

at -20° F

1	4400	4360	4920	4200	4400	4800	4514
2	4400	4200	3200	3800	4360	4400	4060
3	4800	3800	4200	3200	4400	4200	4100
4	4200	4400	3800	4900	4200	4920	4404
	Average Total Torque of Four Bearings						4269

at -65° F

1	5200	4200	4760	5600	6400	5600	5294
2	4800	4200	4760	4800	3160	4200	4320
3	4200	3920	3160	3400	3600	3920	3700
4	5200	6000	6400	6880	6000	5600	6014
	Average Total Torque of Four Bearings						4832

Readings are in mgmm

STARTING TORQUE vs TEMPERATURE

SERIPP K68

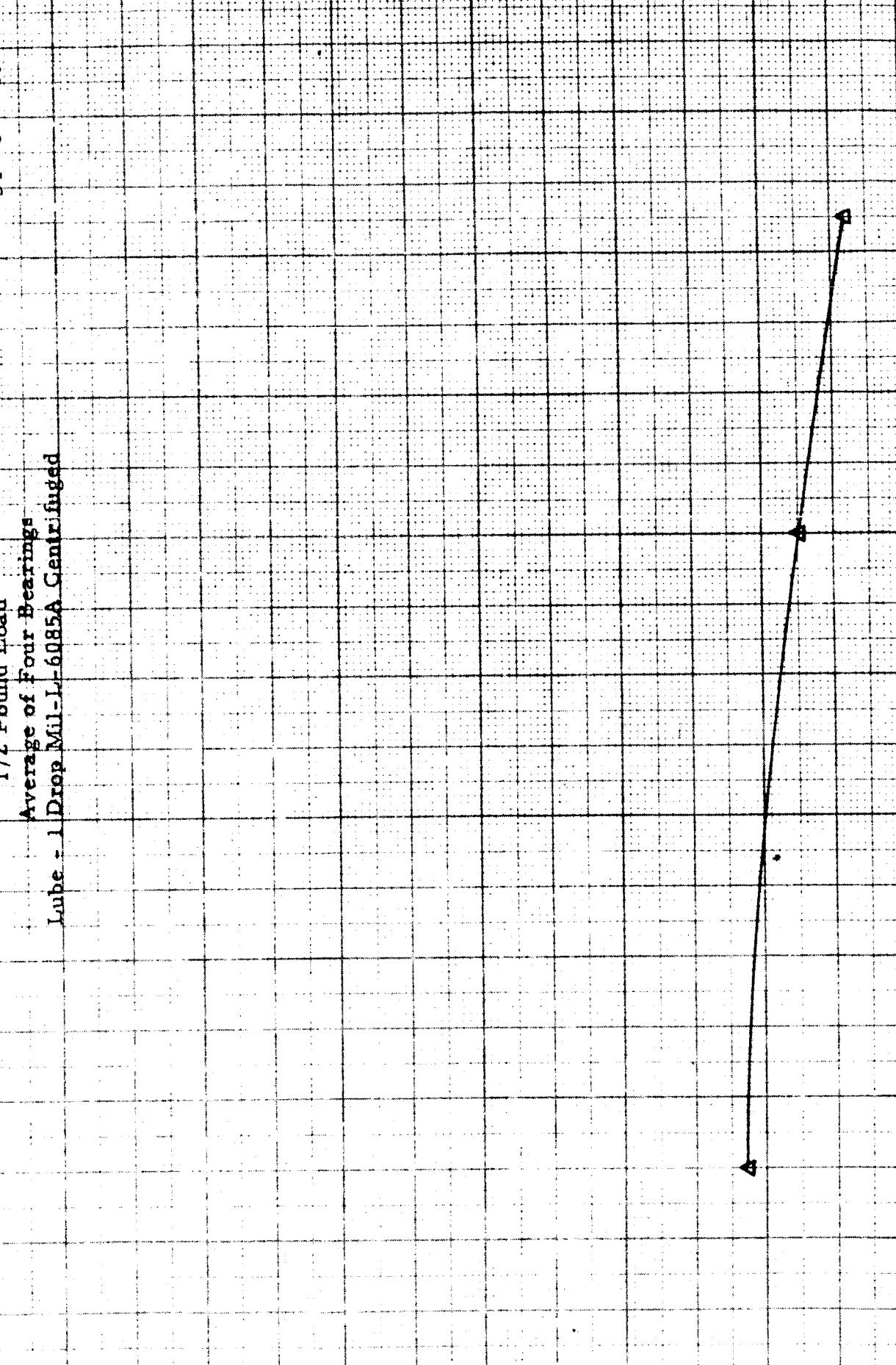
1/2 Pound Load

Average of Four Bearings

Lube = 1 Drop Mil-L-6085A Centrifuged

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80

TEMPERATURE IN °F



TORQUE VS SPEED AT VARIOUS TEMPERATURES

STRIPPERS
1/2 Pound Load
Type of Unit: Beam
Label - MIL-1-035A Centrifuged
54°C
21°C
29°C
65°F
TOP E

50

40

30

20

10

0

TORQUE IN MCG

1000

3000

6000

10000

SPEED IN RPM

STARTING TORQUE vs TEMPERATURE

SFR1PPK68

1 Pound Load

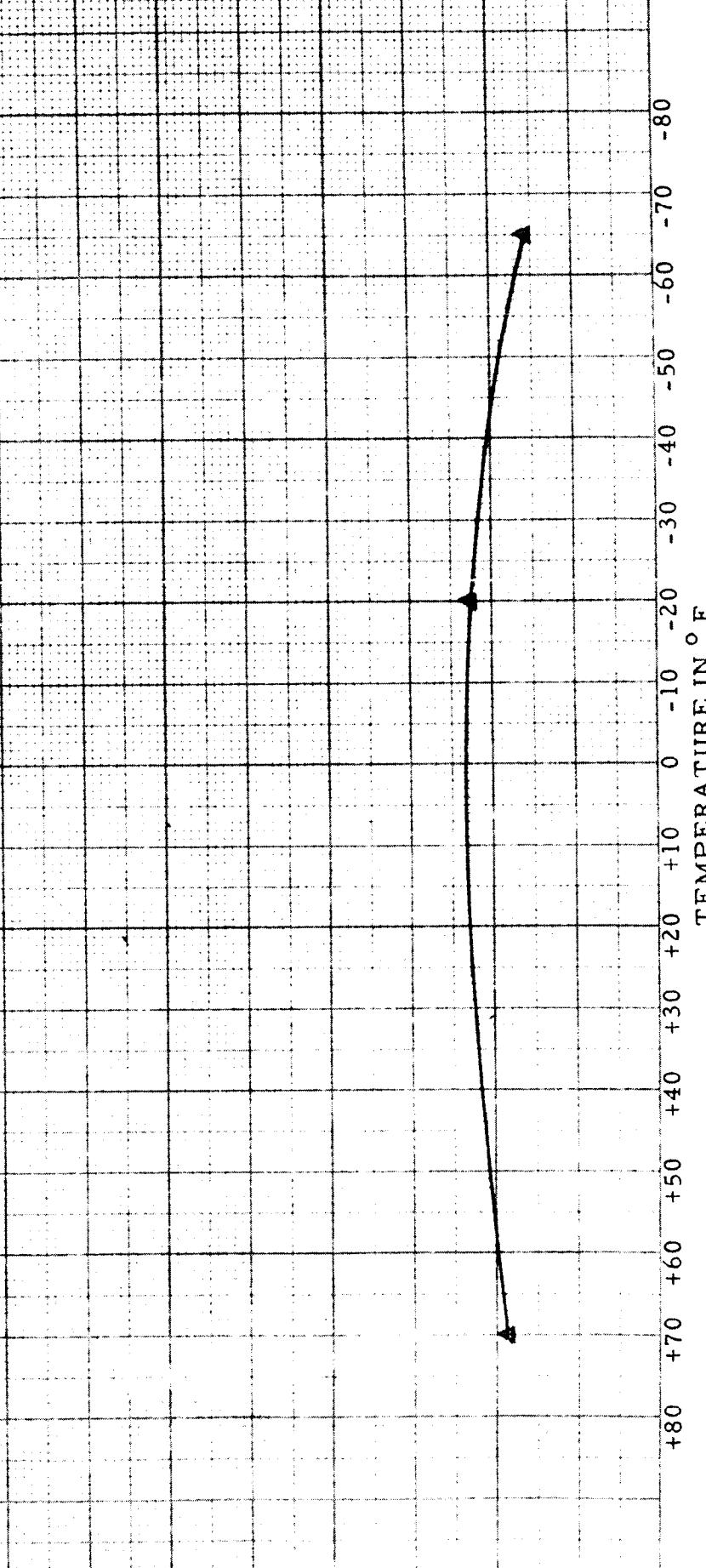
Average of Four Bearings

Lube - 1 Drop MIL-L-6085A Centrifuged

30

20

TORQUE IN MMG



10

TORQUE IS STATED AT VARIOUS TEMPERATURES

SERIAL PK 68

1 POINT + 0.01

100% OF TEST BREAKAGE

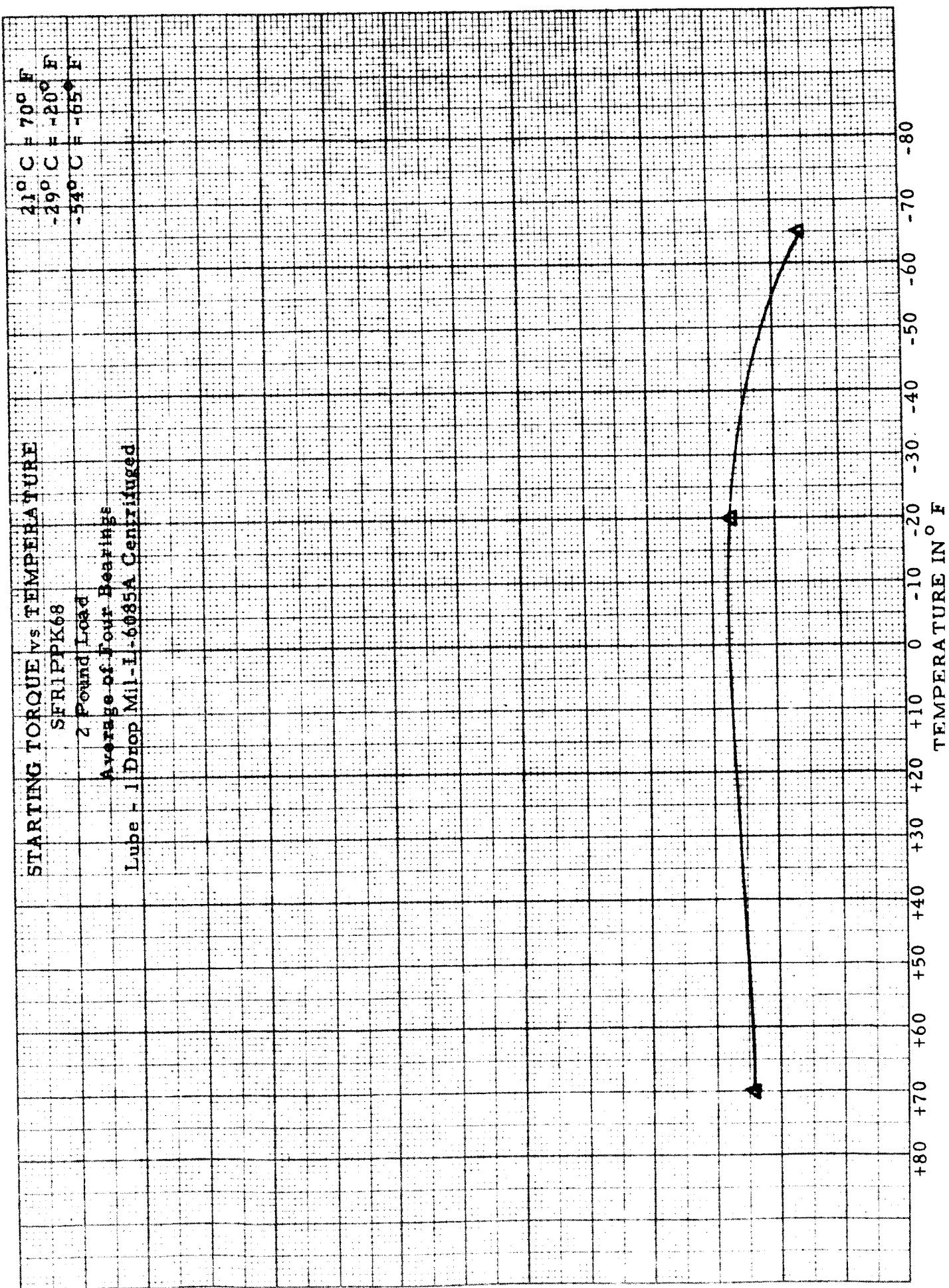
LIBE - MIL - 0185A Centrifuged

21°C - 70°F
29°C - 85°F
34°C - 93°F

10000 3000 1000 300 100 30 10 0

SDFT IN RDW

10000 6000 3000 1000 300 100 30 10 0



TORQUE vs SPEED at VARIOUS TEMPERATURES

SERIALIZED

2 Pound Load

Average of Four Bearings

Lube - MIL-L-6085A Centrifuged

21°C ▲ 70°F
23°C □ 20°F
54°C ■ 65°F

50

40

30

20

10

0

TORQUE IN MMG

0

3000

6000

10000

SPEED IN RPM

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR1PPK68		1/2 Pound Load		Lube - MIL-L-6085A Centrifuged		
BRG. NO.	STARTING	1000 RPM	3000 RPM	6000 RPM	10000 RPM	
		70°F				
1	4,000	6,000	7,500	9,000	11,000	
2	5,000	5,000	7,000	11,000	15,000	
3	8,000	8,000	10,000	11,500	15,000	
4	6,000	7,500	9,000	11,000	13,000	
Avg.	5,750	6,625	8,375	10,625	13,500	
		-20°F				
1	4,000	6,000	7,500	7,500	7,500	
2	1,500	3,500	3,500	5,500	5,500	
3	2,000	4,000	4,000	6,000	8,000	
4	7,500	9,500	11,000	13,000	13,000	
Avg.	3,750	5,750	6,500	8,000	8,500	
		-65°F				
1	2,000	4,000	4,000	6,000	7,000	
2	1,000	3,000	3,000	5,000	5,000	
3	3,000	5,000	6,500	6,500	8,500	
4	2,000	6,000	9,000	9,000	9,000	
Avg.	2,000	4,500	5,625	6,625	7,375	

Readings are in mgmm

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR1PPK68		1 Pound Load		Lube - MIL-L-6085A Centrifuged			
BRG. NO.	STARTING			1000 RPM	3000 RPM	6000 RPM	10000 RPM
				70°F			
1	4,000			4,000	6,000	7,500	9,000
2	5,000			5,000	7,000	9,000	9,000
3	6,000			6,000	10,000	11,500	11,500
4	4,000			6,000	6,000	11,000	13,000
Avg.	4,750			5,250	7,250	9,750	10,625
				-20°F			
1	6,000			7,500	9,000	11,000	13,000
2	3,500			5,500	5,500	7,000	9,000
3	4,000			6,000	8,000	10,000	11,500
4	9,500			11,000	15,000	15,000	17,000
Avg.	5,750			7,500	9,375	10,750	12,625
				-65°F			
1	2,000			4,000	4,000	6,000	7,000
2	5,000			7,500	9,000	11,000	11,000
3	5,000			6,500	8,500	10,000	10,000
4	4,000			4,000	6,000	8,500	9,000
Avg.	4,000			5,500	6,875	8,875	9,250

Readings are in mg/mm

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR1PPK68		2 Pound Load		Lube - MIL-L-6085A Centrifuged		
BRG. NO.	STARTING		1000 RPM 70°F	3000 RPM	6000 RPM	10000 RPM
1	7,500		9,000	11,000	11,000	12,500
2	3,500		5,000	7,000	9,000	11,000
3	6,000		8,000	8,000	10,000	11,500
4	7,500		9,000	11,000	11,000	13,000
Avg.	6,125		7,750	9,250	10,250	12,000
			-20°F			
1	9,000		11,000	13,000	14,000	18,000
2	9,000		9,000	11,000	13,000	13,000
3	2,000		4,000	6,000	8,000	10,000
4	7,500		9,500	17,000	19,000	21,000
Avg.	6,875		8,375	11,750	13,500	15,500
			-65°F			
1	4,000		6,000	7,000	9,000	9,000
2	3,000		5,000	5,000	9,000	9,000
3	3,000		5,000	8,500	8,500	10,000
4	6,000		8,500	11,000	11,000	13,000
Avg.	4,000		6,125	7,875	9,375	10,250

Readings are in mg/mm



STARTING TORQUE V.S. TEMPERATURE

SFR1PK68

AVERAGE OF FOUR BEARINGS

LUBE - 1 DROP F-50

▲ -75 G. load -

11

10

9

8

7

6

5

4

3

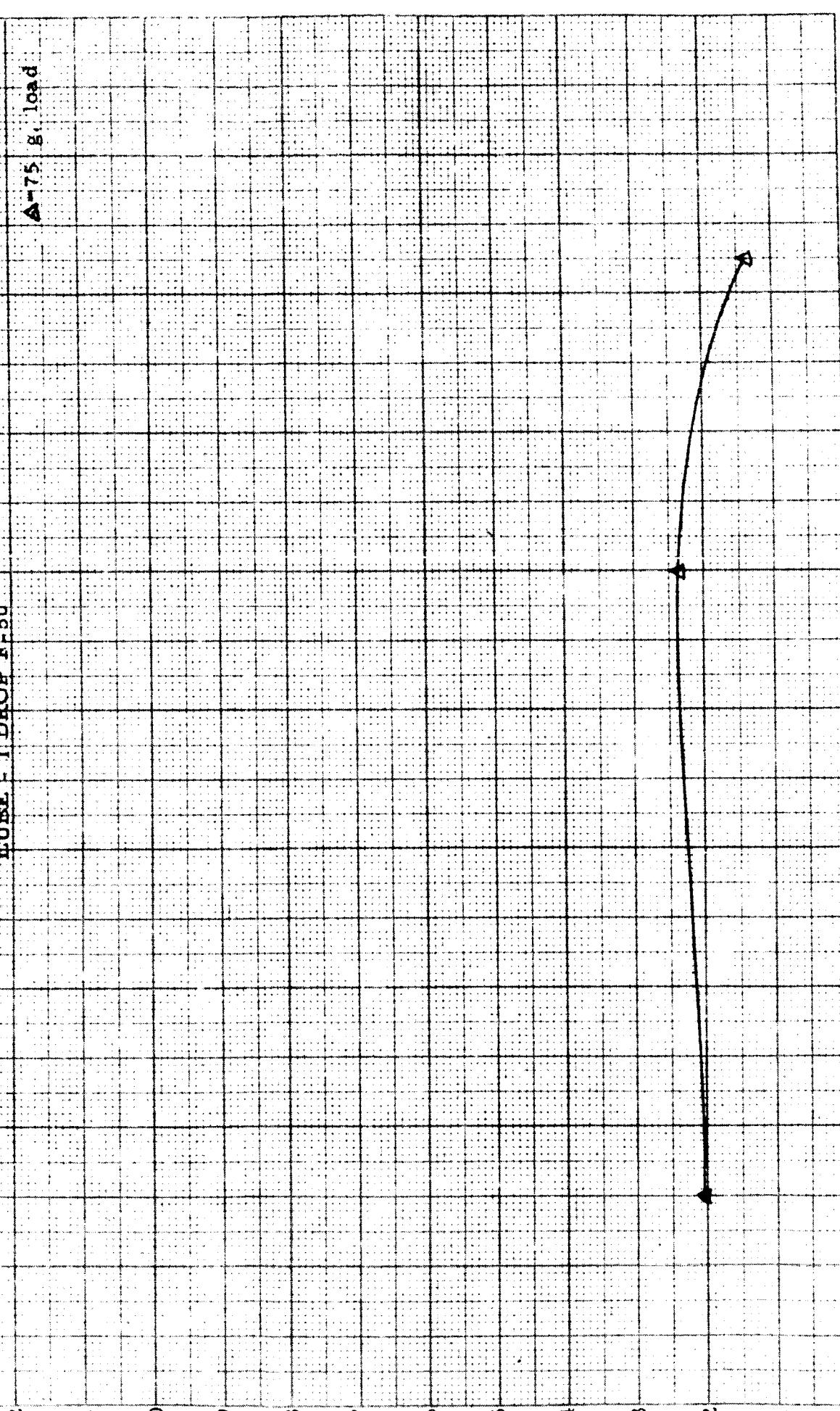
2

1

TORQUE IN MMG

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80

TEMPERATURE IN ° F



TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR1PPK68

1 Drop F-50

Six Starts Per Bearing Under 75-Gram Load
Starts at 70°F

Brg. No.	1	2	3	4	5	6	Avg.
1	1560	1560	1680	2000	2200	2400	1900
2	1560	1680	2000	2200	2200	2400	2007
3	1680	2000	2400	2600	2600	2600	2313
4	1680	1920	2000	2000	2200	2400	2033
Average Total Torque of Four Bearings							2063

at -20°F

1	2000	2000	2200	2400	2480	2480	2260
2	2000	2200	2400	2480	2480	2760	2387
3	2200	2200	2400	2480	2480	2760	2420
4	2000	2200	2400	2480	2760	2760	2434
Average Total Torque of Four Bearings							2376

at -65°F

1	1160	1200	1280	1280	1560	1560	1340
2	1160	1160	1200	1280	1280	1600	1280
3	1100	1200	1560	1560	1600	1680	1460
4	1200	1200	1560	1560	1600	1680	1467
Average Total Torque of Four Bearings							1387

Readings are in mgmm

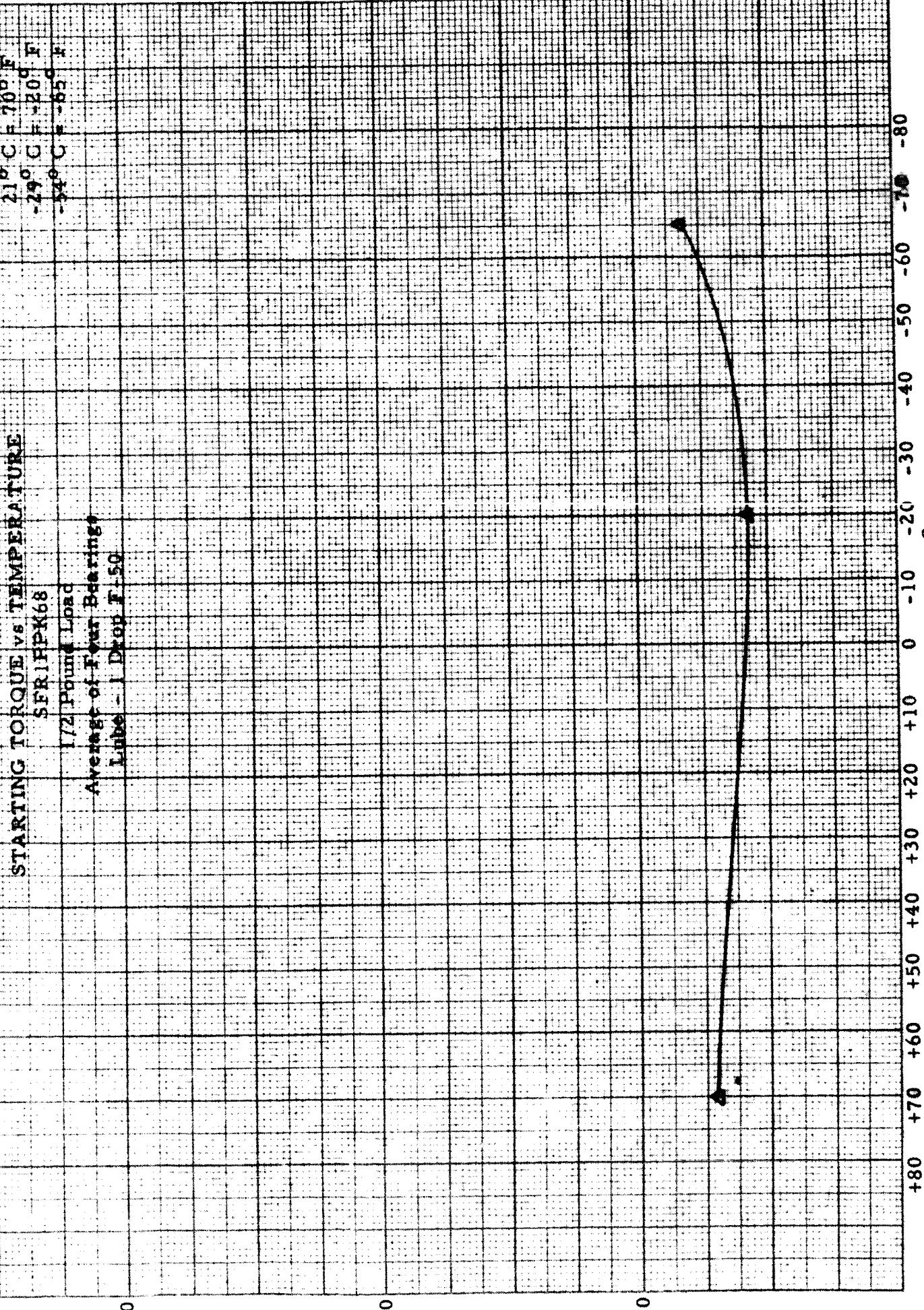
STARTING TORQUE vs TEMPERATURE

SER 1 FPPK68

1/2 Pound Load

Average of Four Bearings

Lube - 1 Drop T - 50



TORQUE AS SEEN IN VARIOUS TEMPERATURES

SERIAL PK 68

1/2 Pound Load

Plus one of Four Bearings

Lube - 1 Drop F-50

21°C 70°F
20°C 68°F
-54°C -65°F

50 40 30 20 10 0 TORQUE IN MMG

SPED IN RPM

10000

6000

3000

1000

0

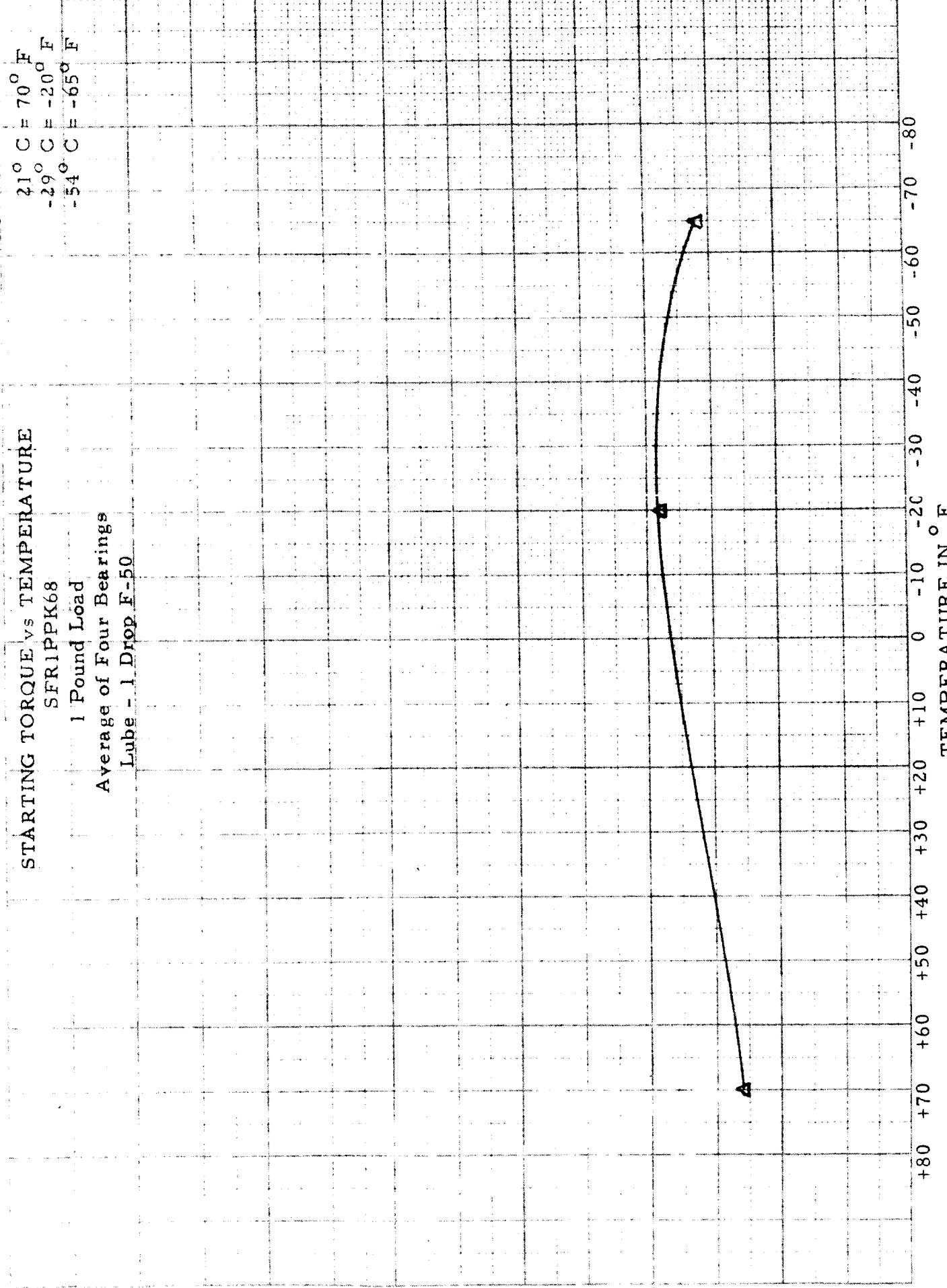
STARTING TORQUE vs TEMPERATURE

SFR1PPK68

1 Pound Load

Average of Four Bearings

Lube = 1. Drop F-50



30

20

10

TORQUE IN MG

41° C = 70° F
-29° C = -20° F
-54° C = -65° F

TORQUE VS SPEED at VARIOUS TEMPERATURES

SFR1PPK68

1 Pound Load

Average of Four Bearings

Lube - 1 Drop P-50

20° F

21°C

39°C

54°C

65°F

50

40

30

20

10

0

TORQUE IN LB-IN

0

3000

6000

10000

SPEED IN RPM

STARTING TORQUE vs TEMPERATURE

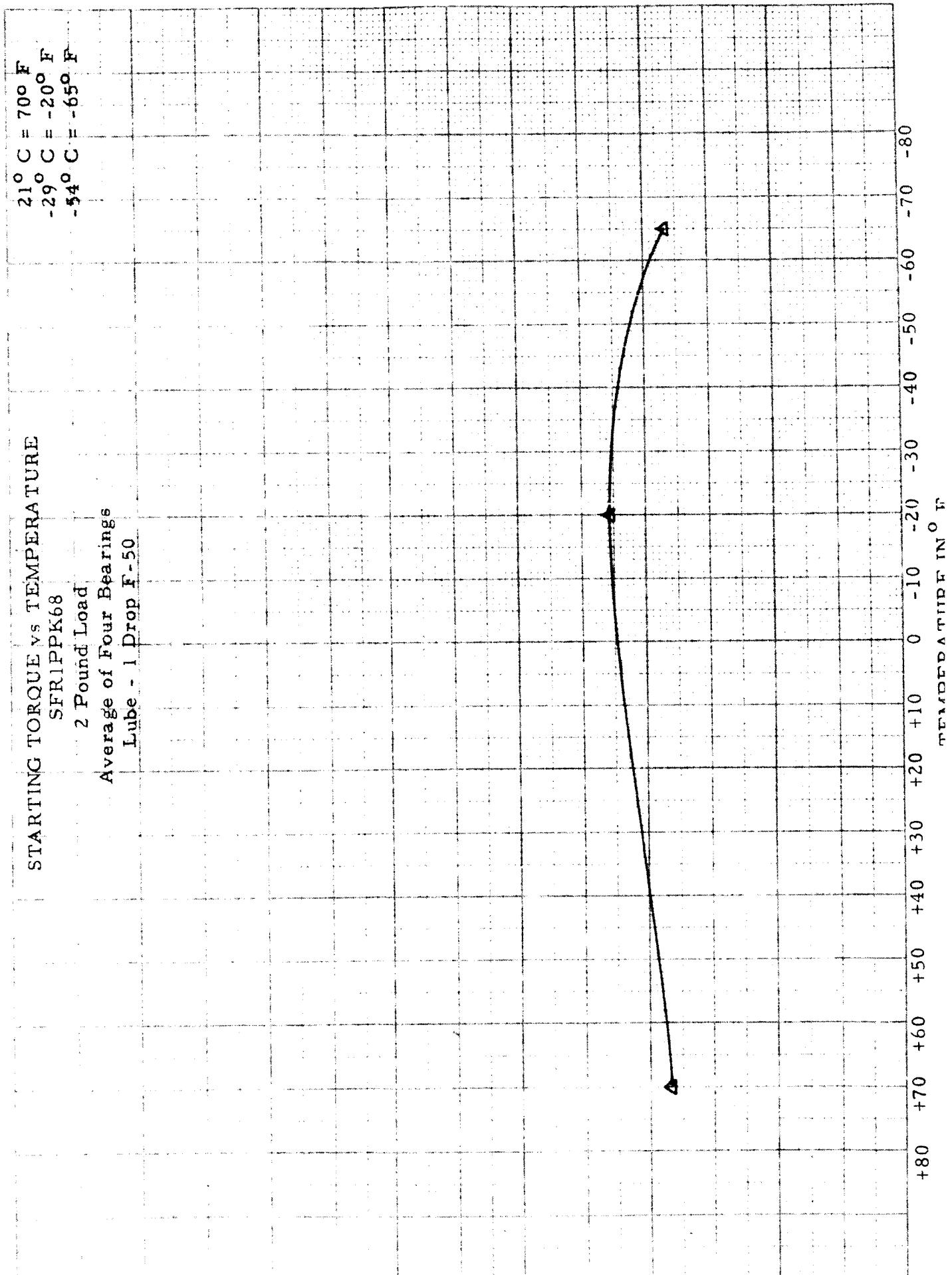
SFR1PPK68

2 Pound Load

Average of Four Bearings

Lube - 1 Drop F-50

30



20

TORQUE IN MG

10

TEMPERATURE IN °C

$$\begin{aligned}21^\circ C &= 700 \text{ F} \\-29^\circ C &= -20^\circ \text{ F} \\-54^\circ C &= -65^\circ \text{ F}\end{aligned}$$

TORQUE VS SPEED AT VARIOUS TEMPERATURES

SERIPIPK68

2 Pound Load

Average of Four Bearings

Lube - 1 Drop F-50

70° F
20° F
65° F
-40° C
-20° C
-5° C

50

40

30

20

10

0 1000 3000 6000

10000

SPEED IN RPM

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR1PPK68

1/2 Pound Load

Lube - 1 Drop F-50

BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10000 RPM
			70°F			
1	6,000		9,500	11,000	12,500	15,500
2	9,000		11,000	13,000	16,000	18,000
3	8,000		6,000	8,000	10,000	11,000
4	5,500		7,500	9,500	11,000	11,000
Avg.	7,125		8,500	10,375	12,375	13,875
			-20°F			
1	7,500		6,000	9,000	11,000	12,500
2	5,000		7,500	9,000	11,000	11,000
3	6,000		4,500	6,000	7,000	7,000
4	5,000		5,000	7,500	9,000	11,000
Avg.	5,875		5,750	7,875	9,500	10,375
			-65°F			
1	7,000		9,000	9,000	16,000	18,000
2	12,500		12,500	14,500	16,000	18,000
3	5,000		7,000	9,000	14,000	19,000
4	9,000		9,000	12,500	14,000	19,000
Avg.	8,375		9,375	11,250	15,000	18,500

Readings are in mgmm



TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR1PPK68		1 Pound Load		Lube - 1 Drop F-50		
BRG. NO.	STARTING	1000 RPM	3000 RPM	6000 RPM	10000 RPM	
		70°F				
1	7,500	12,500	15,000	16,000	18,000	
2	5,000	7,000	9,000	11,000	13,000	
3	6,000	13,000	15,500	16,000	16,000	
4	7,500	11,000	13,000	15,500	15,500	
Avg.	6,500	10,875	13,125	14,625	15,625	
		-20°F				
1	11,000	12,500	14,000	23,000	28,000	
2	13,000	9,000	11,000	13,000	17,500	
3	7,000	9,000	12,000	14,000	15,000	
4	7,500	9,000	11,000	11,000	13,000	
Avg.	9,625	9,875	12,000	15,250	18,375	
		-65°F				
1	6,000	9,000	15,000	18,000	20,000	
2	6,000	11,000	12,500	14,500	16,000	
3	9,000	7,000	9,000	11,000	12,500	
4	11,000	11,000	12,500	16,000	19,000	
Avg.	8,000	9,500	12,250	14,875	16,875	

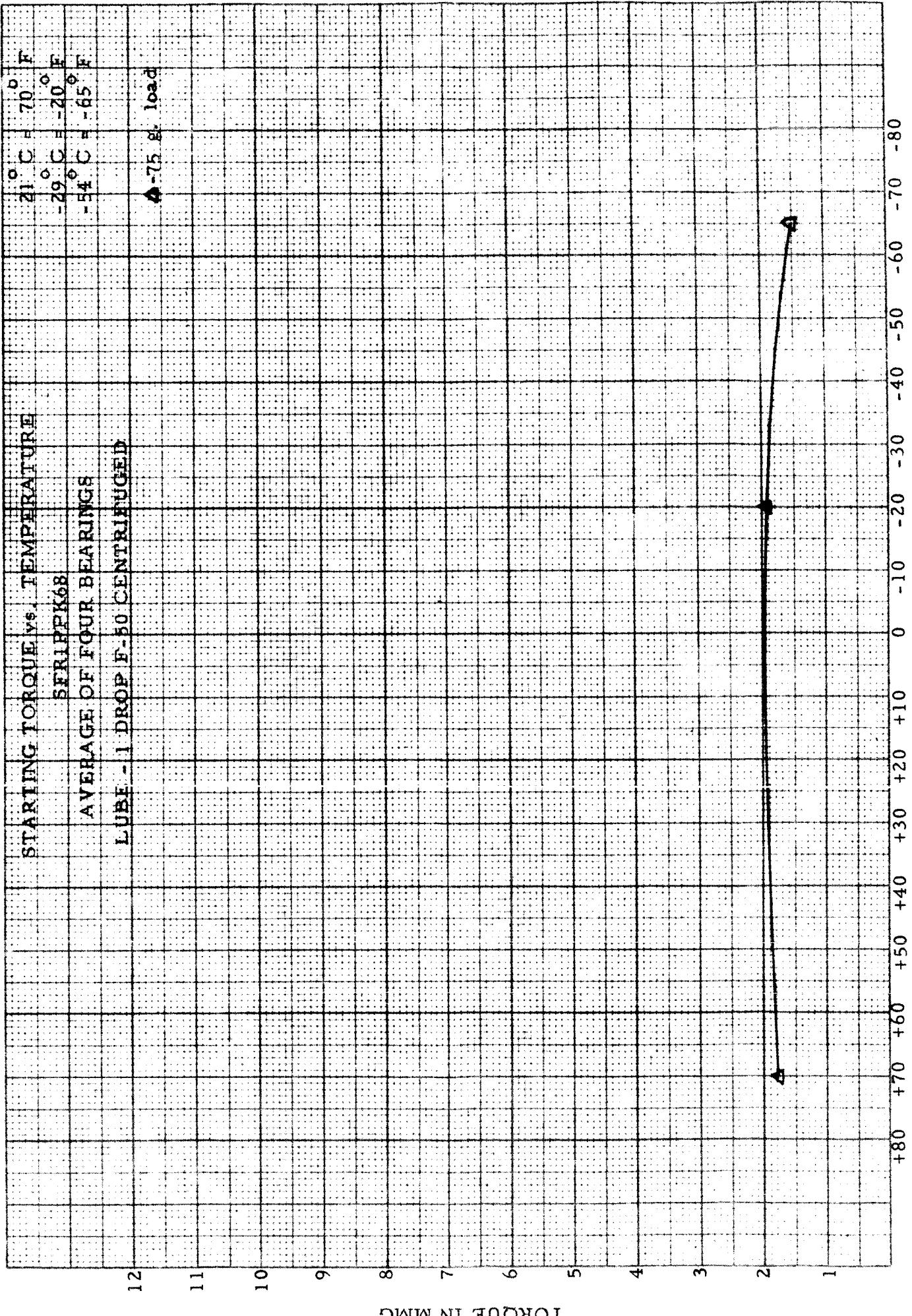
Readings are in mg/mm

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR1I PK68		2 Pound Load		Load - 1 Drop F-50		
BRG. NO.	STARTING	1000 RPM	3000 RPM	6000 RPM	10000 RPM	
		70°F				
1	9,500	11,000	15,500	18,000	19,000	
2	9,000	9,000	11,000	13,000	15,500	
3	11,000	16,000	18,000	20,000	22,000	
4	7,500	11,000	13,000	16,000	18,000	
Avg.	9,250	11,750	14,875	16,750	18,625	
		-20°F				
1	11,000	14,000	16,000	21,000	26,000	
2	9,000	11,000	13,000	15,000	19,000	
3	9,000	9,000	12,000	14,000	18,000	
4	17,000	19,000	24,000	31,000	36,000	
Avg.	11,500	13,250	16,250	20,250	24,750	
		-65°F				
1	9,000	16,000	20,000	21,000	23,000	
2	8,000	8,000	11,000	11,000	12,500	
3	9,000	9,000	11,000	12,500	14,000	
4	11,000	12,500	16,000	18,000	19,000	
Avg.	9,250	11,375	14,500	15,625	17,125	

Readings are in mgmm





TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR1PPK68

F-50 Centrifuged

Six Starts Per Bearing Under 75-Gram Load
Starts at 70° F

Brg. No.	1	2	3	4	5	6	Avg.
1	1200	1560	1560	1680	1680	1920	1600
2	1680	1920	1920	2200	2200	2200	2020
3	1200	1680	1680	1920	2000	2600	1847
4	1360	1360	1680	2000	2000	2200	1767
Average Total Torque of Four Bearings							1808

at -20° F

1	1400	1560	1600	2000	2200	2400	1860
2	1200	1600	1680	2000	2400	2480	1893
3	1400	1680	2000	2200	2400	2480	2027
4	1600	1680	2000	2400	2480	2480	2107
Average Total Torque of Four Bearings							1972

at -65° F

1	1560	1600	1680	1680	1800	1800	1687
2	1200	1280	1560	1560	1600	1600	1467
3	1200	1200	1600	1680	1680	1800	1527
4	1200	1200	1560	1600	1600	1680	1473
Average Total Torque of Four Bearings							1538

Readings are in mgmm

STARTING TORQUE vs. TEMPERATURE

SERIE PK68

1/2 Pound Load

Average of Four Bearings
Lube - 1 Drop 7-50 Centigrade

30

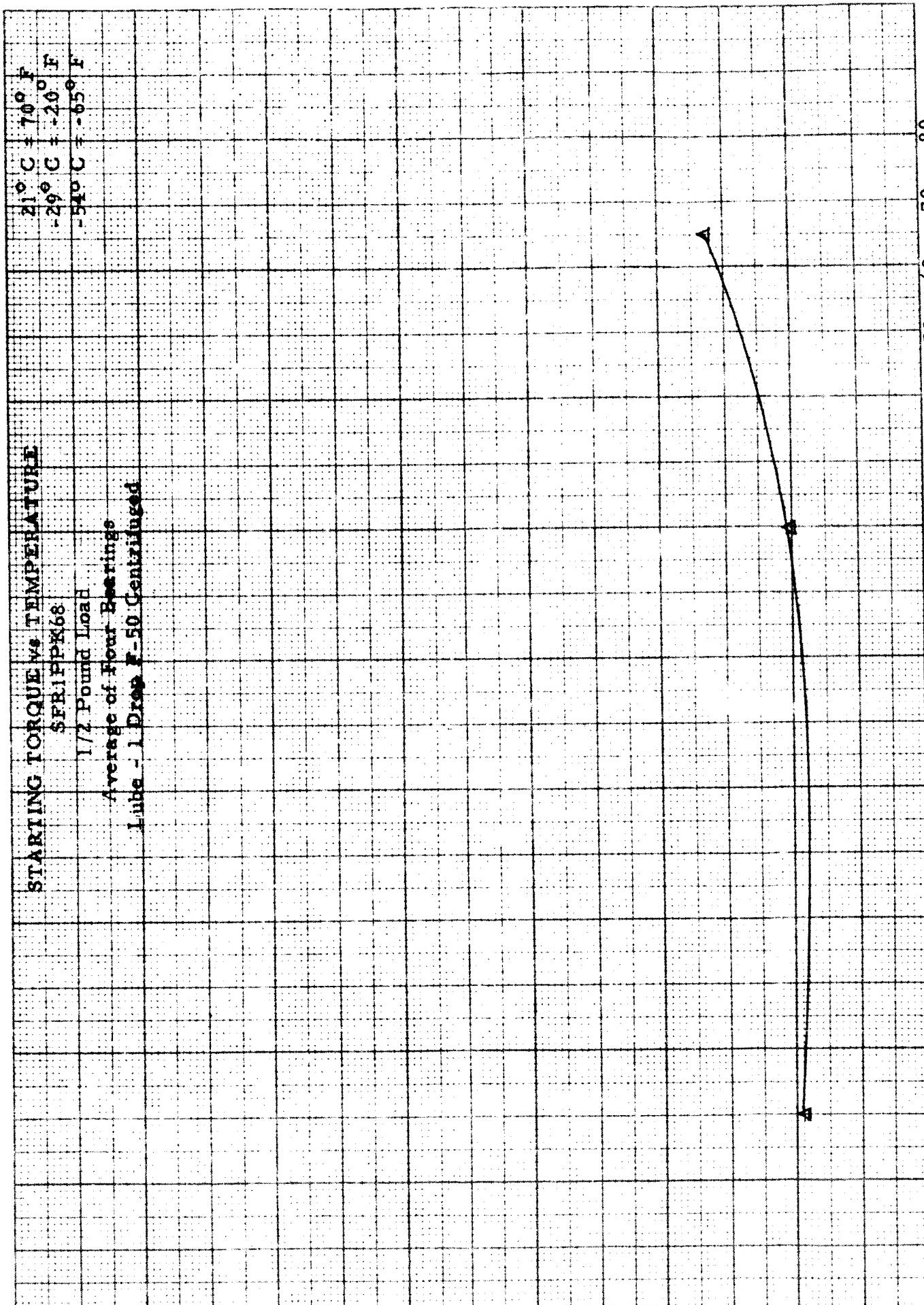
TORQUE IN MMG

20

10

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80

TEMPERATURE IN ° F



TORQUE vs SPEED at VARIOUS TEMPERATURES

SFR1PPK68

1/2 Pound Load

Average of Four Bearings
Lube - 1 Drop E-50 Centrifuged

21°C — 70°F
-29°C — +20°F
-54°C — -65°F

50

40

30

20

10

TORQUE IN MCG

0 1000 2000 3000

4000

5000 6000

7000

10000

SPEED IN RPM

STARTING TORQUE vs TEMPERATURE

SFBI FPK68

1 Pound Head

Average ● Four Points Shown

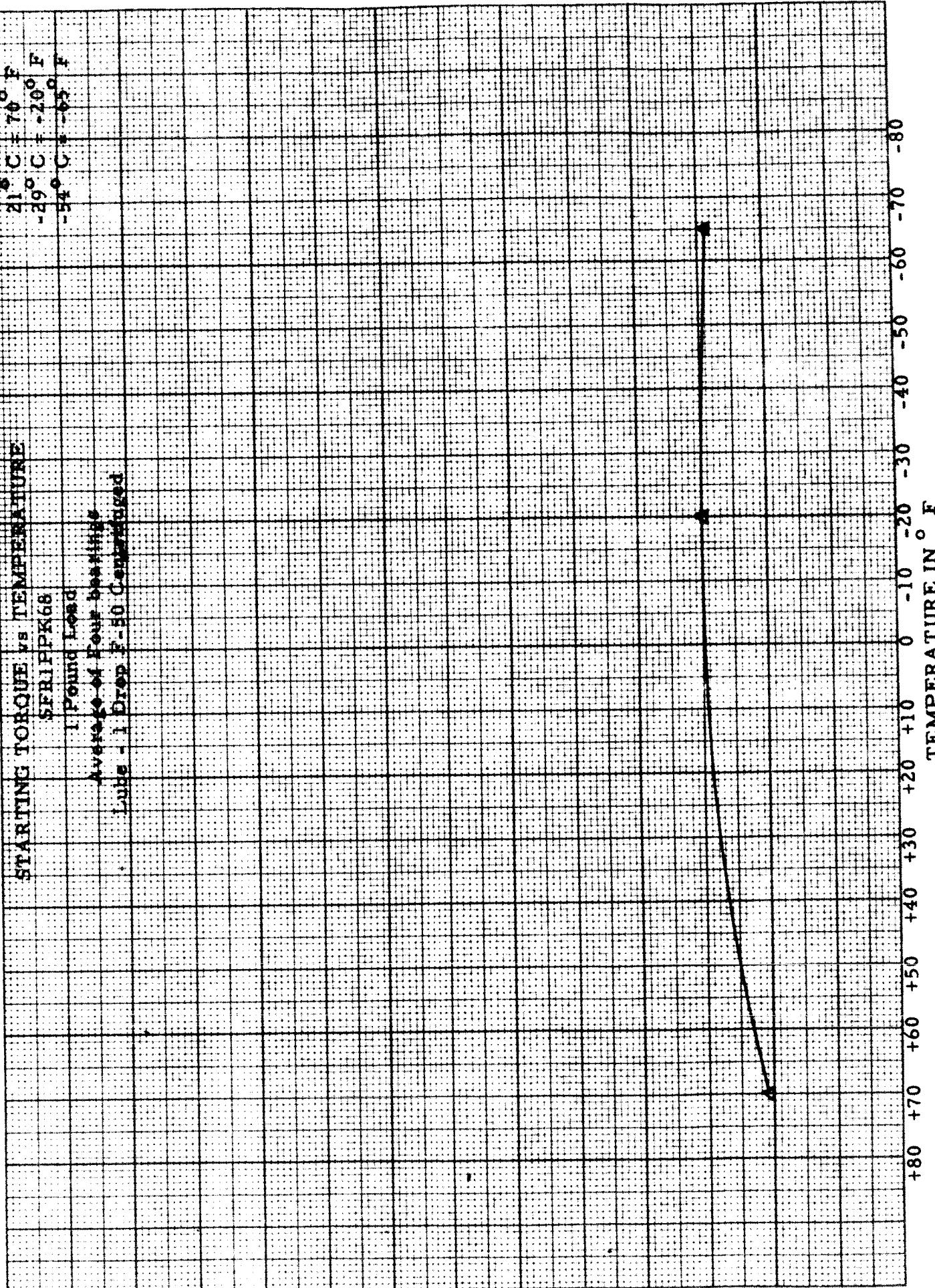
Lube - 1 Drop F-50 Concentrated

30

TORQUE IN MMG

20

10



TORQUE vs SPEED at VARIOUS TEMPERATURES

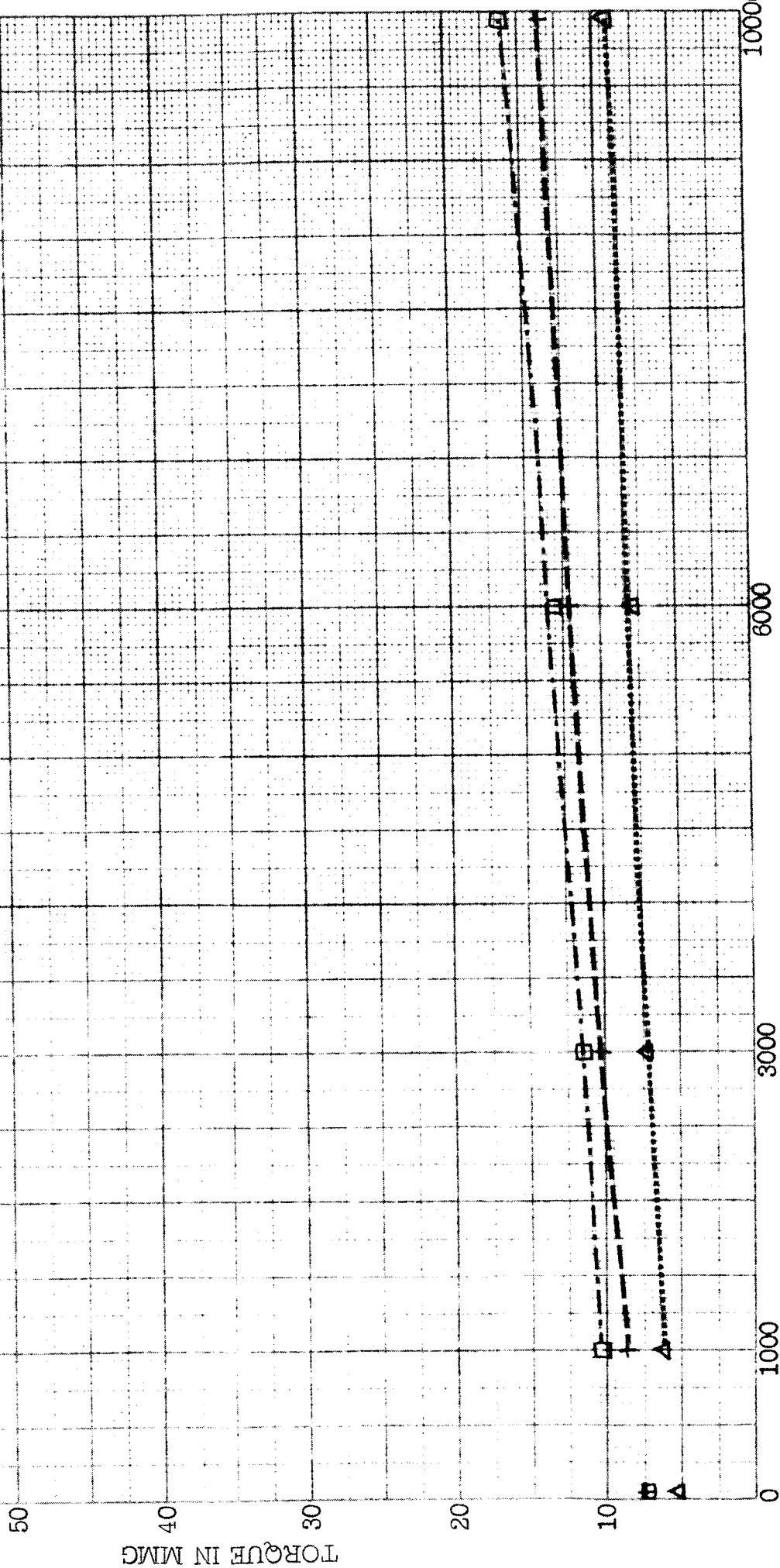
SFR1PPK68

1 Pound Load

Average of Four Bearings

Lube - 1 Drop F-50 Centrifuged

21°C - 70°F
-29°C - 20°F
-54°C - 65°F



STARTING TORQUE vs TEMPERATURE
SFR12PK68
2 Pound Load
Average of Four Bearings
Lube - 1 Drop F-50 Centrifuged

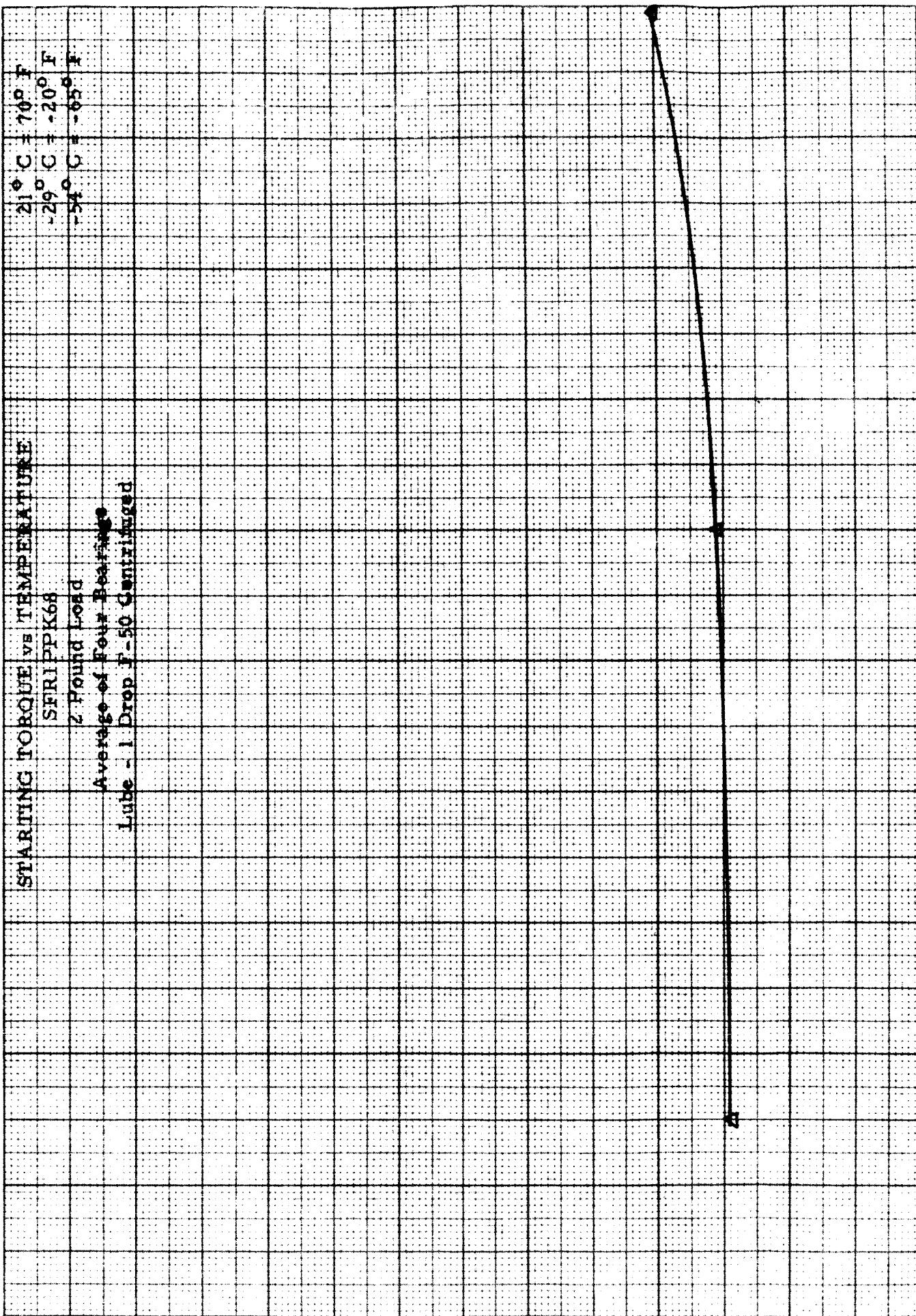
30

TORQUE IN MMG

20

10

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80
TEMPERATURE IN °F



TORQUE vs SPEED at VARIOUS TEMPERATURES

SFR1PPK68

2 Pound Load

Average of Four Bearings
Lube - 1 Drop F-50 Centrifuged

21°C 70°F
-29°C 20°F
-54°C 65°F

50

40

30

20

10

1000

3000

10000

TORQUE IN MMG

SPEED IN RPM

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR1PPK68		1/2 Pound Load		Lube - 1 Drop F-50 Centrifuged		
BRG. NO.	STARTING	1000 RPM	3000 RPM	6000 RPM	10000 RPM	
		70°F				
1	4,000	6,000	6,000	7,500	9,000	
2	5,000	5,000	7,500	9,000	11,000	
3	4,000	4,000	6,000	6,000	8,000	
4	6,000	6,000	7,500	7,000	9,000	
Avg.	4,750	5,250	6,750	7,375	9,250	
		-20°F				
1	7,500	7,500	9,000	9,000	11,000	
2	5,000	5,000	7,500	9,000	12,500	
3	2,000	2,000	4,000	6,000	7,500	
4	6,000	6,000	7,500	7,500	9,000	
Avg.	5,125	5,125	7,000	7,875	10,000	
		-65°F				
1	9,000	11,000	14,000	16,000	20,000	
2	7,000	9,000	11,000	14,000	15,000	
3	8,000	10,000	14,000	16,000	19,000	
4	9,000	11,000	12,500	13,500	14,000	
Avg.	8,250	10,250	12,875	14,625	17,000	
		Readings are in mgmm				



TORQUE VALUES OF INDIVIDUAL BEARINGS

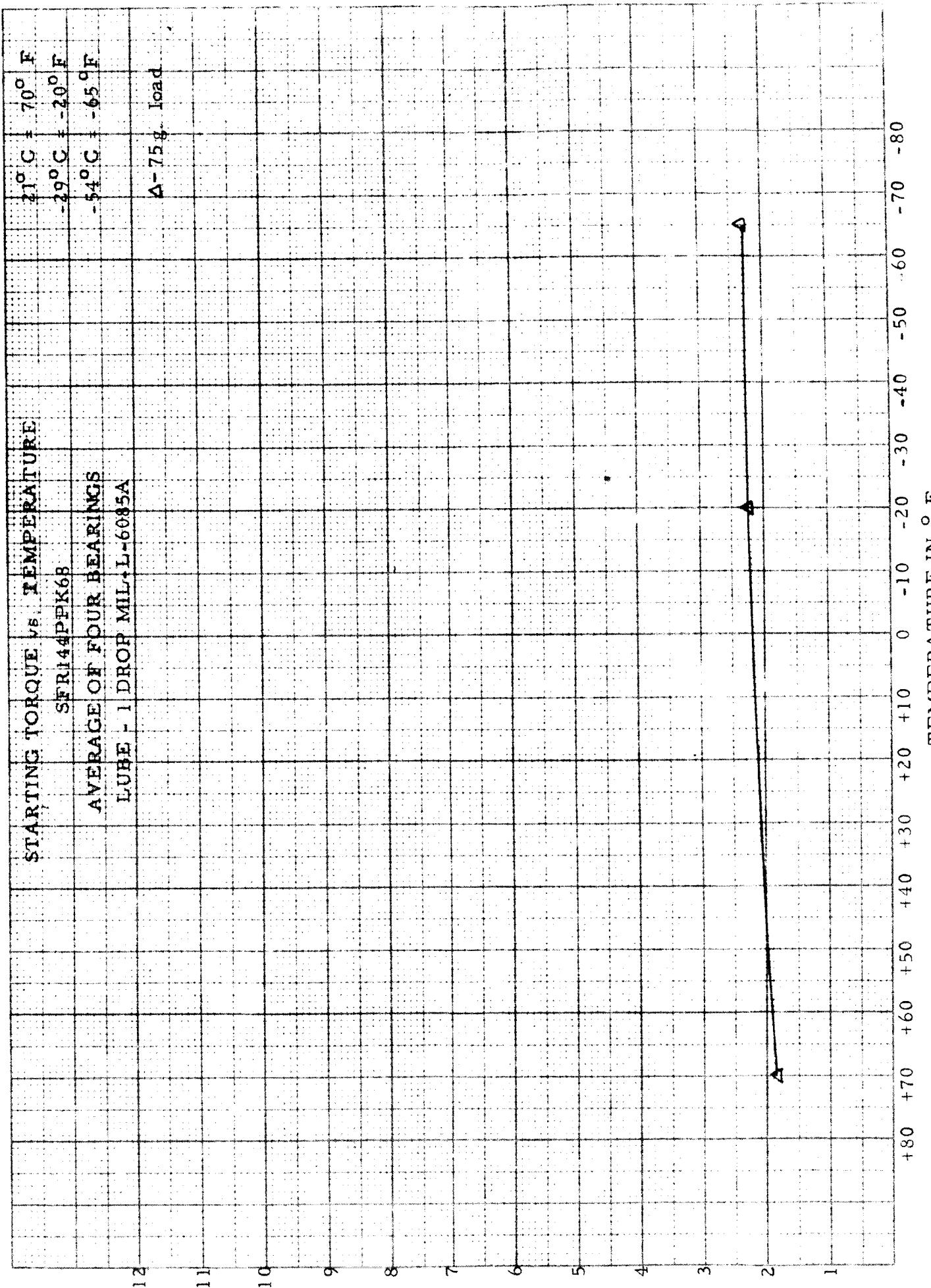
SFR1PPK68		1 Pound Load	Lube - 1 Drop F-50 Centrifuged			
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10000 RPM
			70°F			
1	6,000		6,000	7,500	7,500	9,000
2	5,000		5,000	7,500	7,500	9,000
3	4,000		6,000	6,000	8,000	10,000
4	6,000		7,500	7,500	9,000	9,000
Avg.	5,250		6,125	7,125	8,000	9,250
			-20°F			
1	7,500		9,000	11,000	11,000	12,500
2	9,000		11,000	12,500	12,500	15,000
3	6,000		7,500	9,000	12,000	12,000
4	7,500		7,500	9,000	12,500	15,000
Avg.	7,500		8,750	10,375	12,000	13,625
			-65°F			
1	9,000		11,000	11,000	12,500	16,000
2	7,000		11,000	12,000	14,000	14,000
3	6,000		8,000	10,000	12,500	16,000
4	7,000		11,000	12,500	14,000	19,000
Avg.	7,250		10,250	11,375	13,250	16,250
				Readings	are in mm/mm	

TORQUE VALUES OF INDIVIDUAL BEARINGS

TORQUE VALUES OF INDIVIDUAL BEARINGS						
SFR1PPK68		2 Pound Load		Lube - 1 Drop F-50 Centrifuged		
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10000 RPM
			70°F			
1	6,000		7,500	7,500	9,000	11,000
2	7,500		9,000	9,000	11,000	11,000
3	8,000		10,000	11,000	13,000	13,000
4	7,500		11,000	13,000	15,000	17,500
Avg.	7,250		9,375	10,125	12,000	13,125
			-20°F			
1	9,000		12,500	14,000	16,000	19,000
2	11,000		15,000	17,500	17,500	19,000
3	4,000		6,000	7,500	9,000	13,000
4	7,500		9,000	11,000	12,500	17,500
Avg.	7,875		10,625	12,500	13,750	17,125
			-65°F			
1	9,000		11,000	12,500	16,000	20,000
2	12,500		15,000	19,000	22,000	24,000
3	8,000		10,000	12,500	16,000	19,000
4	11,000		14,000	16,000	17,500	21,000
Avg.	10,125		12,500	15,000	17,875	21,000
				Readings	are in mgmm	

NO. 1100 SEMI-SMOOTH PAPER
10 X 10 MM PER INCH

SPALDING MOSS COMPANY
BOSTON 10 MASS
MADE IN U.S.A.



TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR144PPK68

1 Drop MIL-L-6085A

Six Starts Per Bearing Under 75-Gram Load
Starts at 70° F

Brg. No.	1	2	3	4	5	6	Avg.
1	2000	2000	2000	2000	2000	2000	2000
2	2000	2000	2000	2000	2000	2000	2000
3	1000	1000	1000	2000	2000	2000	1500
4	2000	2000	2000	2000	2000	2000	2000
Average Total Torque of Four Bearings							1875

at -20° F

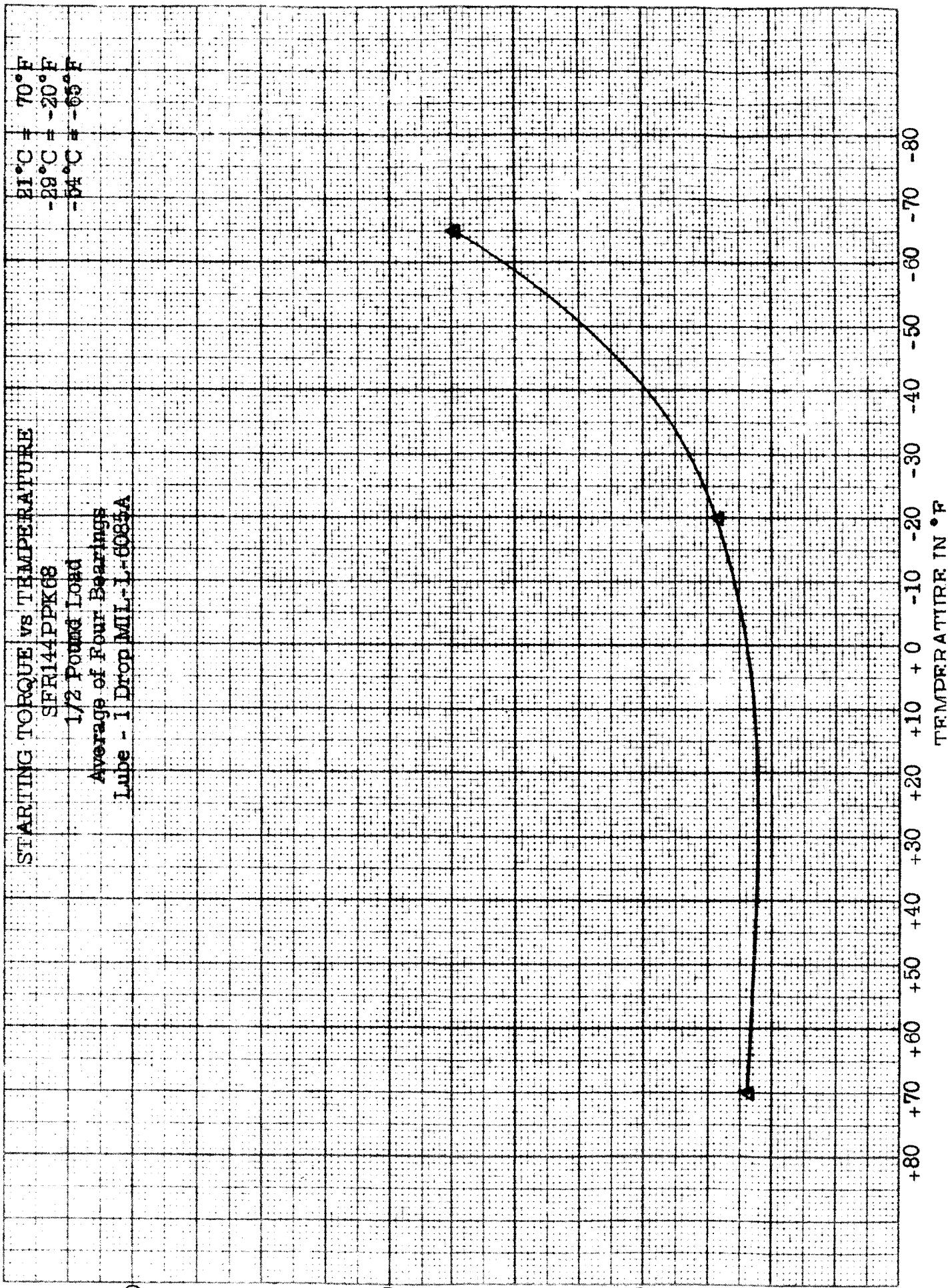
1	1250	1250	2000	2000	2000	2000	1750
2	2000	2000	3000	3000	3000	3000	2667
3	2000	2000	2000	2000	3000	3000	2333
4	2000	2000	2000	2000	3000	3000	2333
Average Total Torque of Four Bearings							2271

at -65° F

1	1000	1000	2000	2000	2000	2000	1667
2	2000	2000	3000	3000	3000	3000	2667
3	2000	2000	2000	2000	3000	3000	2333
4	2000	2000	3000	3000	3000	3000	2667
Average Total Torque of Four Bearings							2333

Readings are in mgmm

STARTING TORQUE VS TEMPERATURE
SFR144PPK68
1/2 Pound Load
Average of Four Bearings
Lube - 1 Drop MIL-L-6081A



TORQUE vs SPEED at VARIOUS TEMPERATURES

SFR144PPK68

1/2 Pound Load

Average of Four Bearings
Lube - 1 Drop MIL-L-8085A

70°F
21°C
29°C
54°C
65°F

70

60

50

40

30

20

10

0

TORQUE IN MMG

1000

3000

6000

10000

SPEED IN RPM

STARTING TORQUE vs TEMPERATURE

SFR144PPK68

1 Pound Load

Average of Four Bearings
Lube - 1 Drop MIL-L-6085A

21°C + 70°F
-29°C - 20°F
-54°C - 65°F

30

TORQUE IN MMG

20

10

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80
TEMPERATURE IN °F

40 30 20 10 0
TORQUE IN LB IN

SPALDING NO. 9 CO., INC.
BOSTON, MASS.
MADE IN U.S.A.

TORQUE vs SPEED at VARIOUS TEMPERATURES

SFR144PPK68

1 Pound Load

Average of Four Bearings

Lube - 1 Drop MIL-L-6085A

21°C 70°F
29°C 20°F
54°C 65°F

70

60

50

40

30

20

10

0

TORQUE IN MMG

1000

3000

6000

10000

STEEP IN RPM

STARTING TORQUE vs TEMPERATURE

SFR144PPK88

2 Pound Load

Average of Four Bearings

Lube - 1 Drop MIL-L-6085A

21°C = 70°F
-29°C = -20°F
-54°C = -65°F

30

20

10

TORQUE IN MMG

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80

© 1964 SPALDING MOSS COMPANY

TORQUE vs SPEED at VARIOUS TEMPERATURES

SFR144PPK08

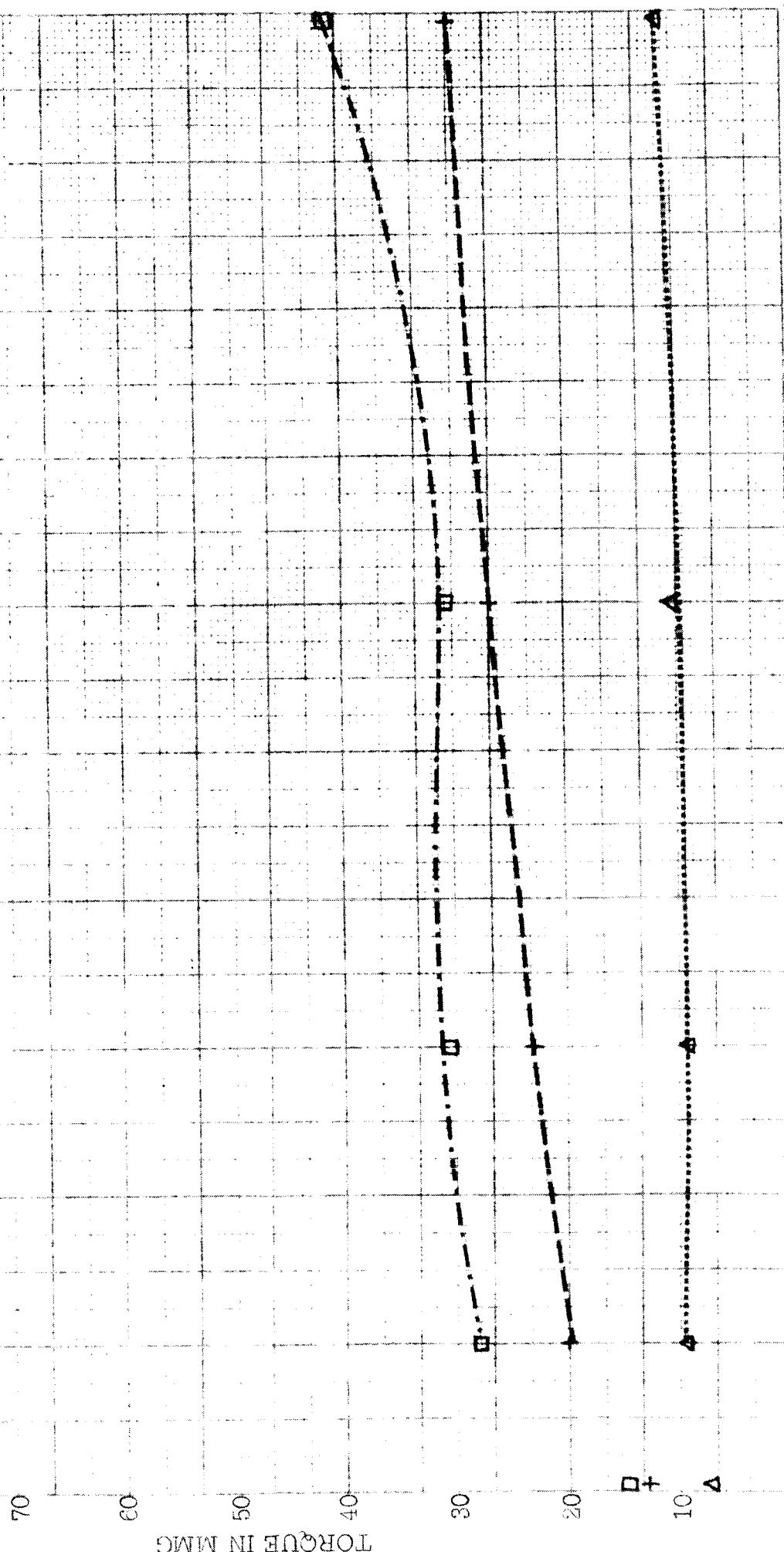
2 Pound Load

Average of Four Bearings

Lube - 1 Drop MIL-L-6085A

70° F
21°C
20° F
54°C
66°F

70° F
21°C
29°C
54°C



10000

6000

SPFED IN RPM

3000

1000

0

TORQUE IN M.M.G.

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR144PPK68		1/2 Pound Load	Lube - 1 Drop MIL-L-6085A			
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10000 RPM
		70°F				
1	6,000		7,500	9,500	11,000	12,500
2	7,500		7,500	9,500	9,500	11,500
3	5,000		8,000	8,000	9,500	9,500
4	5,500		8,000	9,500	11,500	13,000
Avg.	6,000		7,750	9,125	10,375	11,625
		-20°F				
1	9,500		16,000	18,000	23,000	28,500
2	5,500		7,500	9,500	13,500	19,500
3	6,000		12,000	12,000	14,000	18,000
4	7,500		11,000	13,000	17,000	21,000
Avg.	7,125		11,625	13,125	16,875	21,750
		-65°F				
1	26,000		35,000	52,000	54,000	61,000
2	5,500		11,500	13,000	15,500	19,000
3	19,000		28,000	30,000	34,500	39,000
4	19,000		22,500	24,500	28,000	30,000
Avg.	17,375		24,250	29,875	33,000	37,250

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR144PPK68		1 Pound Load		Lube - 1 Drop MIL-L-6085A		
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10000 RPM
			70°F			
1	7,500		7,500	9,500	9,500	11,000
2	7,500		9,500	9,500	9,500	11,500
3	6,500		6,500	8,000	8,000	9,500
4	5,500		8,000	9,500	13,000	13,000
Avg.	6,750		7,875	9,125	10,000	11,250
			-20°F			
1	9,500		18,000	23,000	27,000	34,000
2	13,500		15,500	17,500	19,500	21,500
3	10,000		12,000	16,000	18,000	22,000
4	15,000		19,000	23,000	25,000	29,000
Avg.	12,000		16,125	19,875	22,375	26,025
			-65°F			
1	18,000		48,000	48,000	50,000	54,000
2	11,500		13,000	13,000	17,000	19,000
3	19,000		28,000	34,500	39,000	45,000
4	28,000		30,000	32,000	34,000	37,500
Avg.	19,125		29,250	31,875	35,000	38,875

Readings are in mgmm

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR144PPK68		2 Pound Load	Lube - 1 Drop MIL-I-6085A			
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10000 RPM
			70°F			
1	6,000		7,500	9,500	11,000	12,500
2	7,500		9,500	9,500	9,500	11,500
3	8,000		9,500	8,000	9,500	9,500
4	9,500		11,500	9,500	11,500	13,000
Avg.	7,750		9,500	9,125	10,375	11,625
			-20°F			
1	18,000		21,500	27,000	30,500	34,000
2	15,500		25,500	25,500	27,500	29,500
3	10,000		18,000	22,000	24,000	29,000
4	9,500		15,000	19,000	23,000	25,000
Avg.	13,250		20,000	23,375	26,250	29,375
			-65°F			
1	16,000		37,000	39,000	40,500	42,500
2	15,500		19,000	21,000	29,500	39,000
3	10,500		19,000	24,000	28,000	39,000
4	19,000		36,000	37,500	40,000	44,000
Avg.	15,250		27,750	30,375	34,500	41,125
					Readings are in rpm	

STARTING TORQUE VS TEMPERATURE

SFR144 PPK88

Average of Four Bearings

Lube - 1 Drop of MLI-1-60B5A Centrifuged

21°C = 70°F
-29°C = -20°F
-54°C = -65°F

Δ - 75 g. load

12

11

10

9

8

7

6

5

4

3

2

1

TORQUE IN MMG

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80
TEMPERATURE IN °F

To Be Rechecked

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR144PPK68
 MIL-L-6085A Centrifuged
 Six Starts Per Bearing Under 75-Gram Load
 Starts at 70° F

Brg. No.	1	2	3	4	5	6	Avg.
1							507
2							450
3							513
4							503
Average Total Torque of Four Bearings							493

at -20° F

1	4400	6040	4200	8400	7600	4400	5840
2	4360	4400	4920	7600	4800	8400	5747
3	8400	5200	5600	6040	7200	7600	6674
4	5600	8400	6700	7600	5200	4800	6384
Average Total Torque of Four Bearings							6162

at -65° F

1	6000	6760	5200	5960	3560	5200	5447
2	5960	6000	6800	5200	4400	4800	5527
3	5200	5960	4400	3560	9560	7960	6107
4	7400	7160	6000	4760	4800	5600	5954
Average Total Torque of Four Bearings							5759

Readings are in mgmm

STARTING TORQUE vs TEMPERATURE

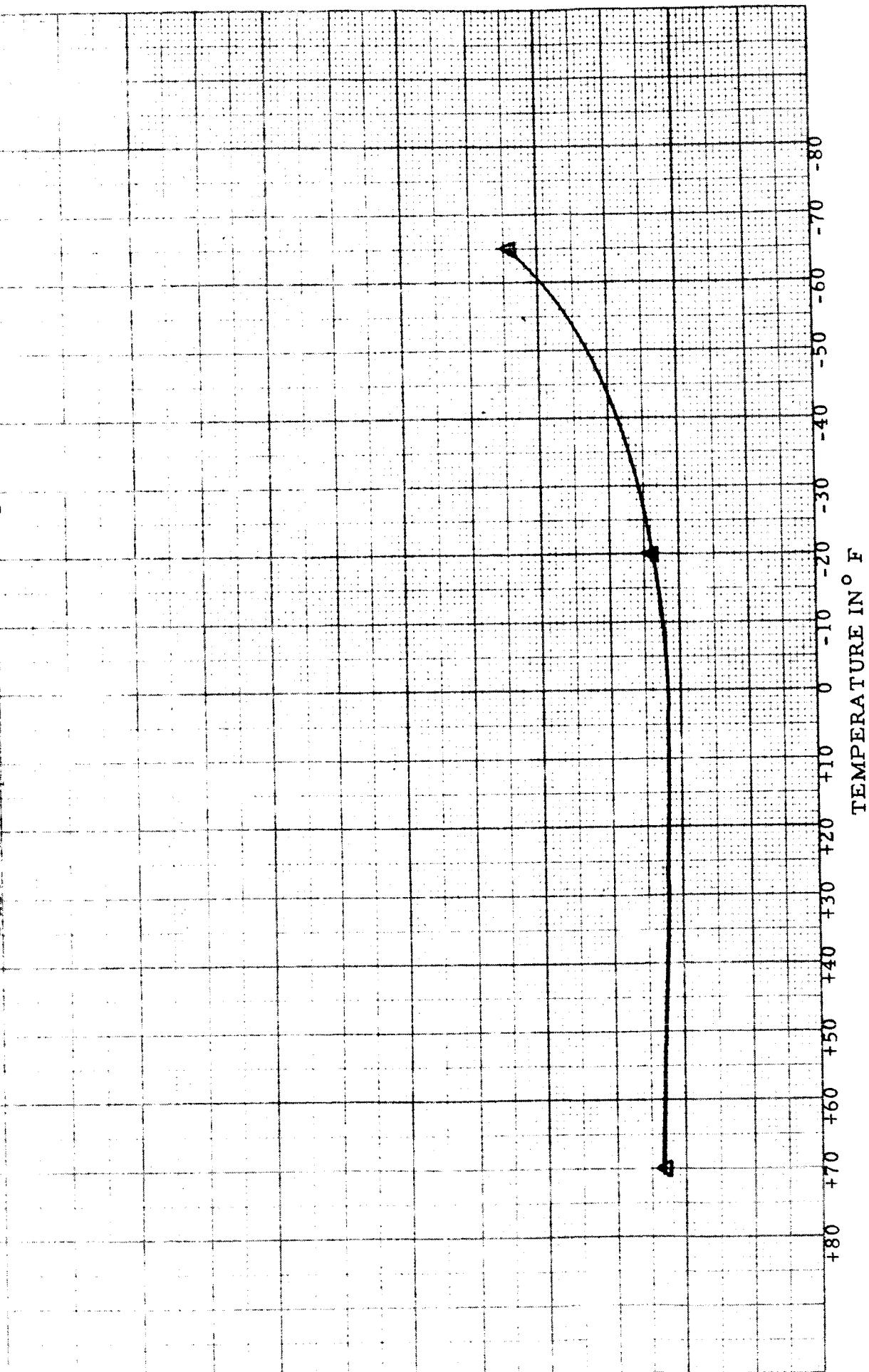
SFR144PPK68

1/2 Pound Load

Average of Four Bearings

Lube - 1 Drop Mil-L-6085A Centrifuged

30



20

TORQUE IN MMG

10

TORQUE VS SPEED at VARIOUS TEMPERATURES

SFR 144 PPK 68
 $\frac{1}{2}$ Pound Load
Averages of Four Bearings
Lube - MIL-L-3085A Centrifuged

-70° F

-20° F

60° F

20° C

60° C

100° C

50

40

30

20

10

TORQUE IN MCG

0 1000 3000 6000

10000

SPEED IN RPM

100000

STARTING TORQUE vs TEMPERATURE

SFR144 PPK68

1 Pound Load

Average of Four Bearings

Lube = 1 Drop Mil-L-6085A Centrifuged

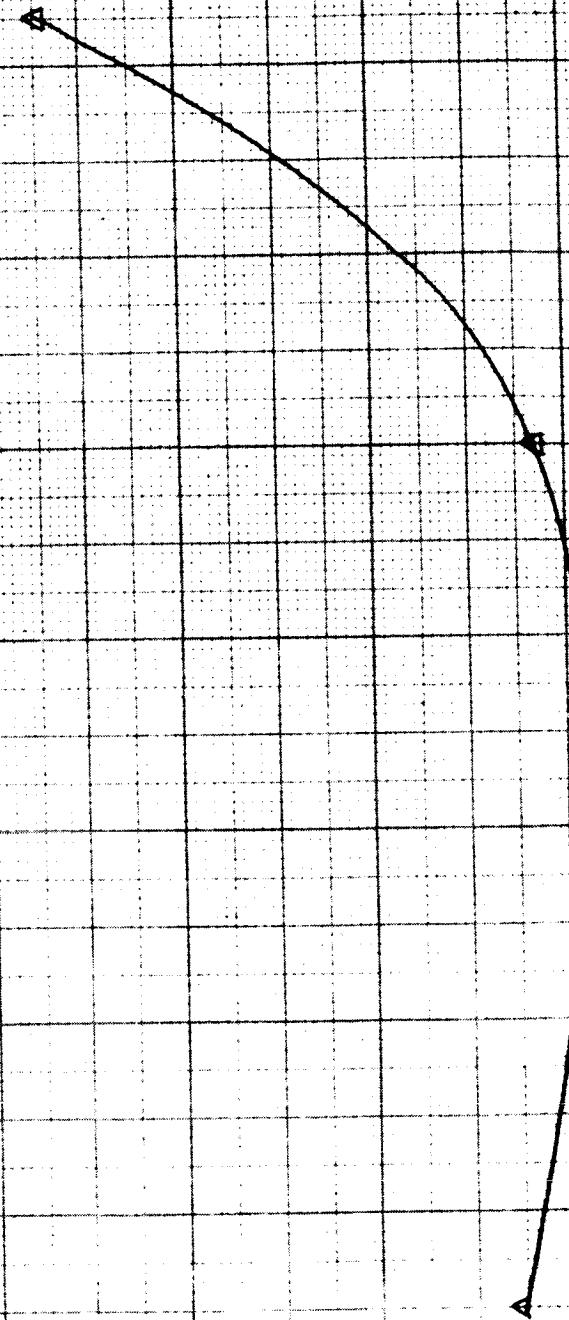
30

20

TORQUE IN MMG

10

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80
TEMPERATURE IN ° F



TORQUE vs SPEED at VARIOUS TEMPERATURES

SERIAL PPK 68

FORMED 100%

Autoclaved Wood Boardings

Tube - MIL-L-8085A Centrifuged

10 °C - 1000 RPM
20 °C - 1000 RPM
21 °C - 1000 RPM
22 °C - 1000 RPM
23 °C - 1000 RPM
24 °C - 1000 RPM

50

40

30

20

10

0

TORQUE IN MCG

1000

3000

6000 10000 SPEED IN RPM

10000

STARTING TORQUE vs TEMPERATURE

SFR144PPK68

2 Pound Load

Average of Four Bearings

Lube - 1 Drop MIL-L-6085A Centrifuged

30

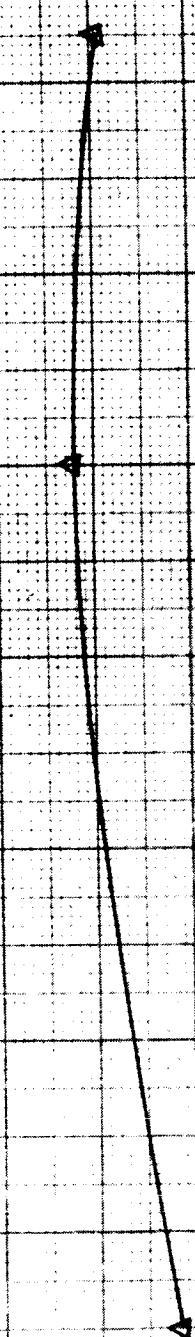
20

TORQUE IN MMG

10

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80

TEMPERATURE IN ° F



TORQUE TESTS AT VARIOUS TEMPERATURES

SFR144PPK68

8-Pinend Thread

Autopace of Four Bearings

Label - M11-1-3085A Centringd

21°C 70°F
29°C 20°F
64°C 85°F

50

40

30

20

10

0

TORQUE IN MMG

3000

6000

10000

SPREAD IN RPM

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR144PPK68		1/2 Pound	load	Lube - Mil-L-6085A	Centrifuged	
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10,000 RPM
			70° F			
1	8,000		11,500	13,000	14,500	18,000
2	6,000		8,000	10,000	10,000	12,000
3	5,500		5,500	6,500	10,000	15,000
4	4,000		4,000	6,000	9,500	11,500
Avg.	5,875		7,250	8,875	11,000	14,125
			-20° F			
1	6,000		8,000	10,000	11,500	13,000
2	6,000		8,000	8,000	10,000	12,000
3	6,000		6,000	8,000	8,000	10,000
4	6,000		7,500	7,500	9,500	9,500
Avg.	6,000		7,375	8,375	9,750	11,125
			-65° F			
1	8,000		12,500	14,500	14,500	16,500
2	16,000		16,000	18,000	20,000	24,000
3	14,500		16,000	16,000	18,000	19,500
4	6,000		11,500	11,500	13,500	15,000
Avg.	11,125		14,000	15,000	16,500	18,750

Readings are in mgmm.

TORQUE VALUES OF INDIVIDUAL BEARINGS

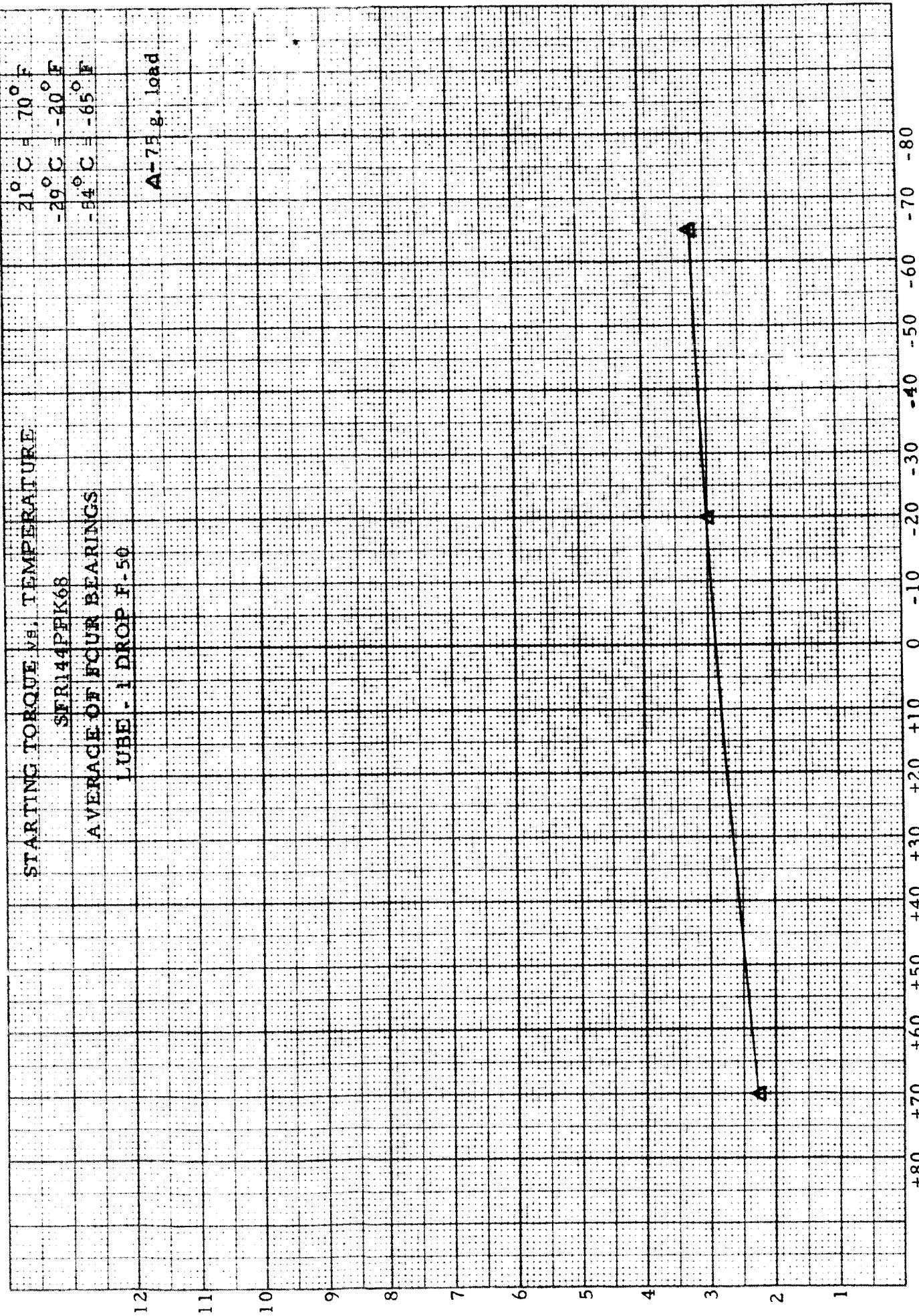
SFR144PPK68		1 Pound Load	Lube - Mil-L-6085A Centrifuged			
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10,000 RPM
			70° F			
1	4,000		10,000	11,500	14,500	18,000
2	6,000		14,000	14,000	18,000	22,000
3	6,500		5,500	10,000	12,000	12,000
4	9,500		2,000	6,000	7,500	9,500
Avg.	6,500		7,875	10,375	13,000	15,375
			-20° F			
1	6,000		8,000	10,000	11,500	13,000
2	8,000		14,000	14,000	16,000	16,000
3	2,000		4,000	6,000	8,000	8,000
4	7,500		7,500	9,500	11,500	13,500
Avg.	5,875		8,375	9,875	11,750	12,625
			-65° F			
1	11,000		12,500	14,500	18,500	20,000
2	16,000		16,000	16,000	20,000	22,000
3	28,500		36,500	38,500	40,000	40,000
4	19,500		38,500	40,000	40,000	42,000
Avg.	18,750		25,875	27,250	29,625	31,000

Readings are in mgmm.

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR144PPK68		2 Pound Load	Lube - Mil-L-6085A Centrifuged			
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10,000 RPM
			70° F			
1	6,000		8,000	8,000	10,000	11,500
2	4,000		6,000	6,000	10,000	10,000
3	13,500		15,000	17,000	19,000	19,000
4	18,500		19,000	20,500	22,500	22,500
Avg.	10,500		12,000	12,875	15,375	15,750
			-20° F			
1	11,500		13,000	14,500	16,500	18,000
2	14,000		16,000	24,000	26,000	30,000
3	8,000		18,000	22,000	24,500	28,500
4	19,000		22,500	25,000	25,000	27,000
Avg.	13,125		17,375	21,375	23,000	25,875
			-65° F			
1	10,000		33,500	35,500	37,000	37,000
2	10,000		14,000	16,000	18,000	20,000
3	19,500		21,500	23,000	28,500	38,500
4	10,000		15,000	17,000	19,500	19,500
Avg.	12,375		21,000	22,875	25,750	28,750

Readings are in mgmm.



TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR144PPK68

1 Drop F-50

Six Starts Per Bearing Under 75-Gram Load
Starts at 70°F

Brg. No.	1	2	3	4	5	6	Avg.
1	2000	2000	2000	2000	2000	2000	2000
2	2000	2000	2000	2000	2000	2000	2000
3	2000	2000	2000	2000	2000	2000	2000
4	3000	3000	3000	3000	3000	3000	3000
	Average Total Torque of Four Bearings						2250

at -20°F

1	3000	3000	3000	3000	3000	3000	3000
2	4000	4000	4000	4000	4000	4000	4000
3	2000	2000	2000	2000	2000	2000	2000
4	3000	3000	3000	3000	3000	3000	3000
	Average Total Torque of Four Bearings						3000

at -65°F

1	4000	4000	4000	4000	4000	4000	4000
2	3000	3000	4000	4000	4000	4000	3667
3	2000	2000	2000	2000	2000	2000	2000
4	3000	3000	3000	3000	4000	4000	3334
	Average Total Torque of Four Bearings						3250

Readings are in mgmm

STARTING TORQUE vs TEMPERATURE

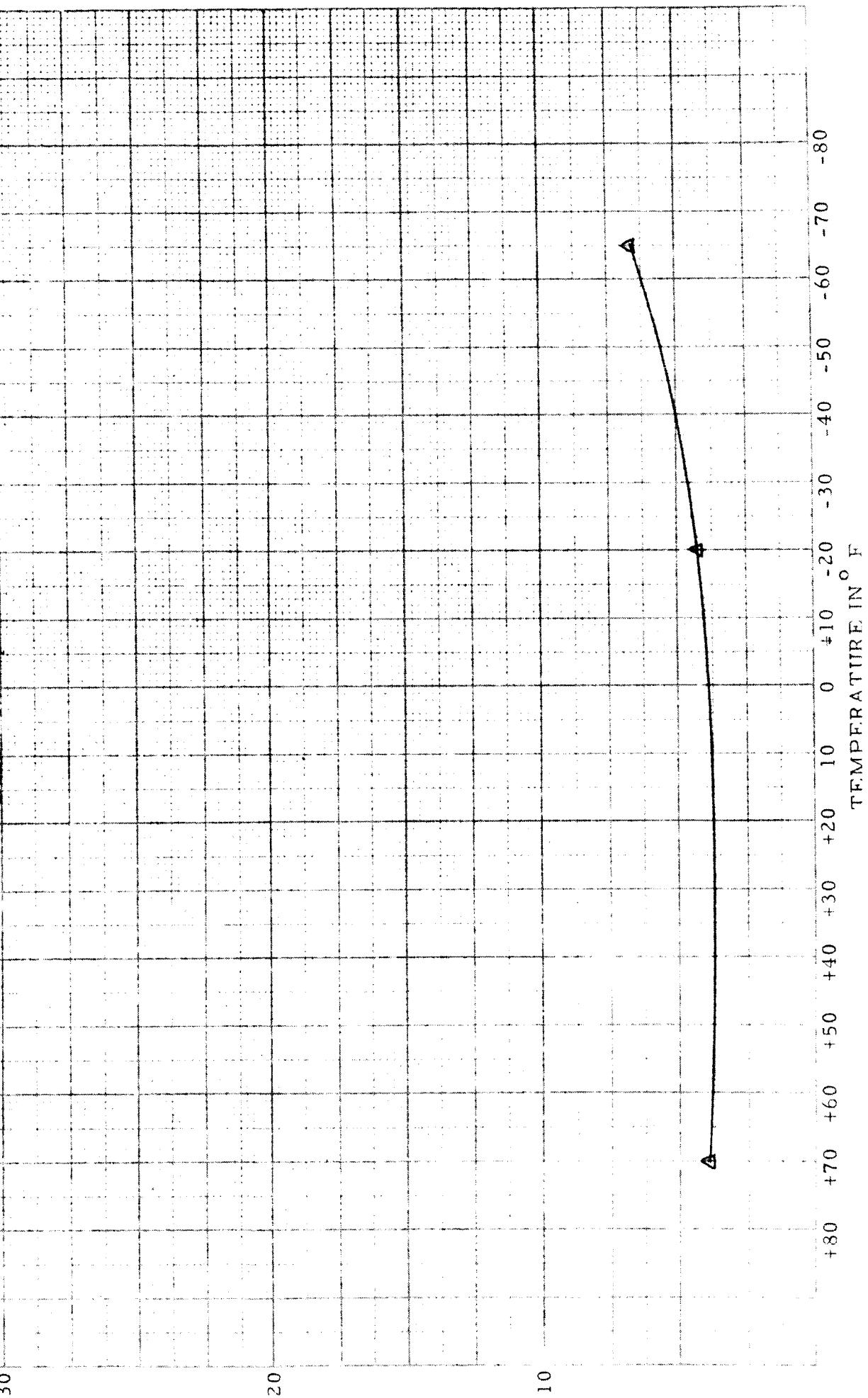
SFR14PPK68

1/2 Pound Load

Average of Four Bearings

Lubricant - 1 Drop F-50

30



TORQUE vs SPEED at VARIOUS TEMPERATURES

SRR 144 PPK6

1/2 Pound Load

Average of Four Bearings

Tube - 1 Drop H-60

21°C —
29°C —
54°C —
70°F —
20°F —
65°F —

50

40

30

20

10

0

GRAVITY IN EARTH

10000

6000

3000

0

SPED IN RPM

STARTING TORQUE vs TEMPERATURE

SFR14PPK68

1 Pound Load

Average of Four Bearings
Lube - 1 Drop F-50

30

20

TORQUE IN MMG

21° C = 70° F
-29° C = -20° F

-54° C = -65° F

10

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80
TEMPERATURE IN ° F

TORQUE vs SPEED at VARIOUS TEMPERATURES

SFR144PPE68

Pound Load

Average of Four Bearings

Lube = 1 Drop F-50

21°C - 70°F
29°C - 85°F
54°C - 130°F

50

TORQUE IN LB-IN.

40

30

20

10

0

1000
3000
6000

10000

SPD IN RPM

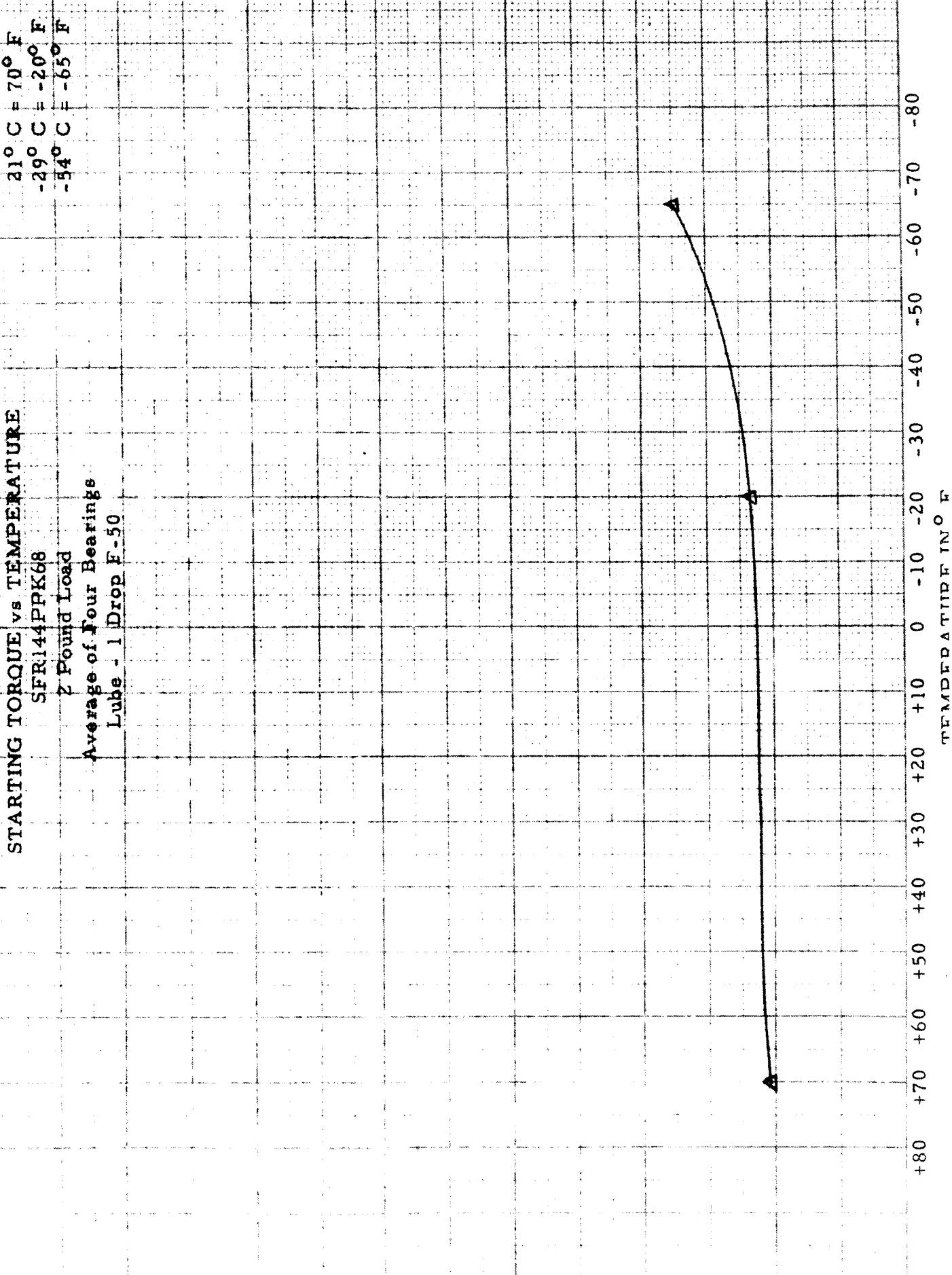
STARTING TORQUE vs TEMPERATURE

SFR144 PHK68

2 Pound Load

Average of Four Bearings

Lube : 1 Drop E-50



TORQUE vs SPEED at VARIOUS TEMPERATURES

SHE 14 API 68

2 FORMED LOADED

Ave. 200 ft-lbs 892 ft-lbs
Lube - 1 Drop F-50

21°C 40°F
22°C 50°F
23°C 60°F

50

40

30

20

10

0

DYNAFAT NIT EG 200 T

0

1000

3000

6000

10000

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR144PPK68		1/2 Pound Load		Lube - 1 Drop F-50		
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10000 RPM
			70°F			
1	4,000		4,000	6,000	7,500	9,500
2	2,000		5,000	5,000	5,000	7,000
3	5,000		6,000	6,000	8,000	10,000
4	5,000		5,000	5,000	5,000	7,500
Avg.	4,000		5,000	5,500	6,500	8,500
			-20°F			
1	3,000		5,000	7,500	7,500	9,000
2	7,500		9,000	13,000	17,500	19,500
3	4,000		4,000	4,000	6,000	7,500
4	3,000		3,000	5,000	7,500	7,500
Avg.	4,375		5,250	7,375	9,625	10,875
			-65°F			
1	7,000		7,000	7,000	9,000	11,000
2	9,000		12,000	15,000	18,000	34,000
3	4,000		4,000	6,000	7,500	11,000
4	7,000		7,000	7,000	9,000	9,000
Avg.	6,750		7,500	8,750	10,875	16,250

Readings are in mgmm



TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR144PPK68		1 Pound Load		Lube - 1 Drop F-50		
BRG. NO.	STARTING	1000 RPM	3000 RPM	6000 RPM	10000 RPM	
		70°F				
1	6,000	7,500	9,500	9,500	11,000	
2	3,500	5,000	7,000	9,000	11,000	
3	6,000	8,000	10,000	11,000	11,000	
4	5,500	5,500	7,500	7,500	9,500	
Avg.	5,250	6,500	8,500	9,250	10,625	
		-20°F				
1	5,000	7,500	9,000	9,000	11,000	
2	5,000	7,500	11,000	15,000	19,500	
3	6,000	6,000	7,500	7,500	9,000	
4	5,000	5,000	5,000	7,500	9,000	
Avg.	5,250	6,500	8,125	9,750	12,125	
		-65°F				
1	5,000	5,000	7,000	9,000	11,000	
2	9,000	9,000	11,000	12,000	13,000	
3	6,000	6,000	6,000	7,500	11,000	
4	5,000	7,000	7,000	9,000	11,000	
Avg.	6,250	6,750	7,750	9,375	11,500	

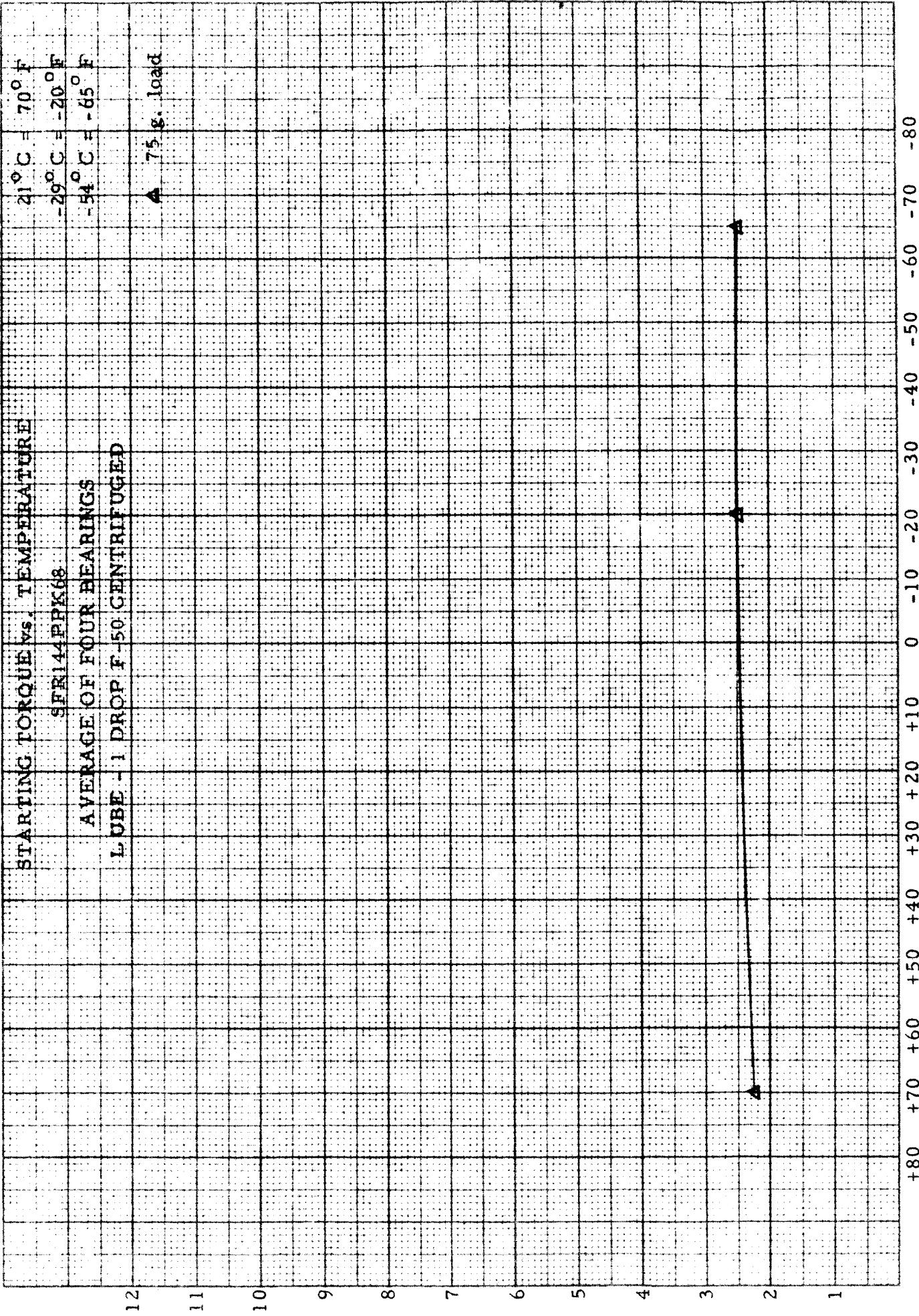
Readings are in mgmm

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR144PPK68		2 Pound Load		Lube - 1 Drop F-50		
BRG. NO.	STARTING	1000 RPM	3000 RPM	6000 RPM	10000 RPM	
		70°F				
1	6,000	6,000	7,500	9,500	11,000	
2	3,500	5,000	7,000	9,000	9,000	
3	6,000	8,000	10,000	10,000	10,000	
4	5,500	5,500	7,500	9,500	11,000	
Avg.	5,250	6,125	8,000	9,500	10,250	
		-20°F				
1	5,000	7,500	9,000	11,000	12,000	
2	7,500	9,000	11,000	13,000	15,000	
3	6,000	7,500	7,500	9,000	12,000	
4	5,000	7,500	9,000	9,000	11,000	
Avg.	5,875	7,875	9,125	10,500	12,500	
		-65°F				
1	9,000	11,000	13,000	15,000	16,000	
2	6,000	9,000	11,000	12,000	13,000	
3	11,000	11,000	12,000	12,000	14,000	
4	9,000	11,000	14,000	14,000	16,000	
Avg.	8,750	10,500	12,500	13,250	14,750	

Readings are in mgmm





TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR144PPK68

1 Drop F-50 Centrifuged
Six Starts Per Bearing Under 75-Gram Load
Starts at 70°F

Brg. No.	1	2	3	4	5	6	Avg.
1	2000	2000	2000	2000	2000	2000	2000
2	2000	2000	2000	2000	2000	2000	2000
3	2000	2000	2000	2000	2000	2000	2000
4	3000	3000	3000	3000	3000	3000	3000
						Average Total Torque of Four Bearings	2250

at -20°F

1	2000	2000	2000	2000	2000	2000	2000
2	3000	3000	3000	3000	3000	3000	3000
3	3000	3000	3000	3000	3000	3000	3000
4	2000	2000	2000	2000	2000	2000	2000
						Average Total Torque of Four Bearings	2500

at -65°F

1	2000	2000	3000	3000	3000	3000	2667
2	3000	3000	3000	3000	3000	3000	3000
3	1000	1000	1000	2000	2000	2000	1500
4	2000	2000	3000	3000	3000	3000	2667
						Average Total Torque of Four Bearings	2458

Readings are in mgmm

STARTING TORQUE vs TEMPERATURE

SFR144PPK68

1/2 Pound Load

Average of Four Bearings

Lube - 1 Drop F-50 Centrifuged

30

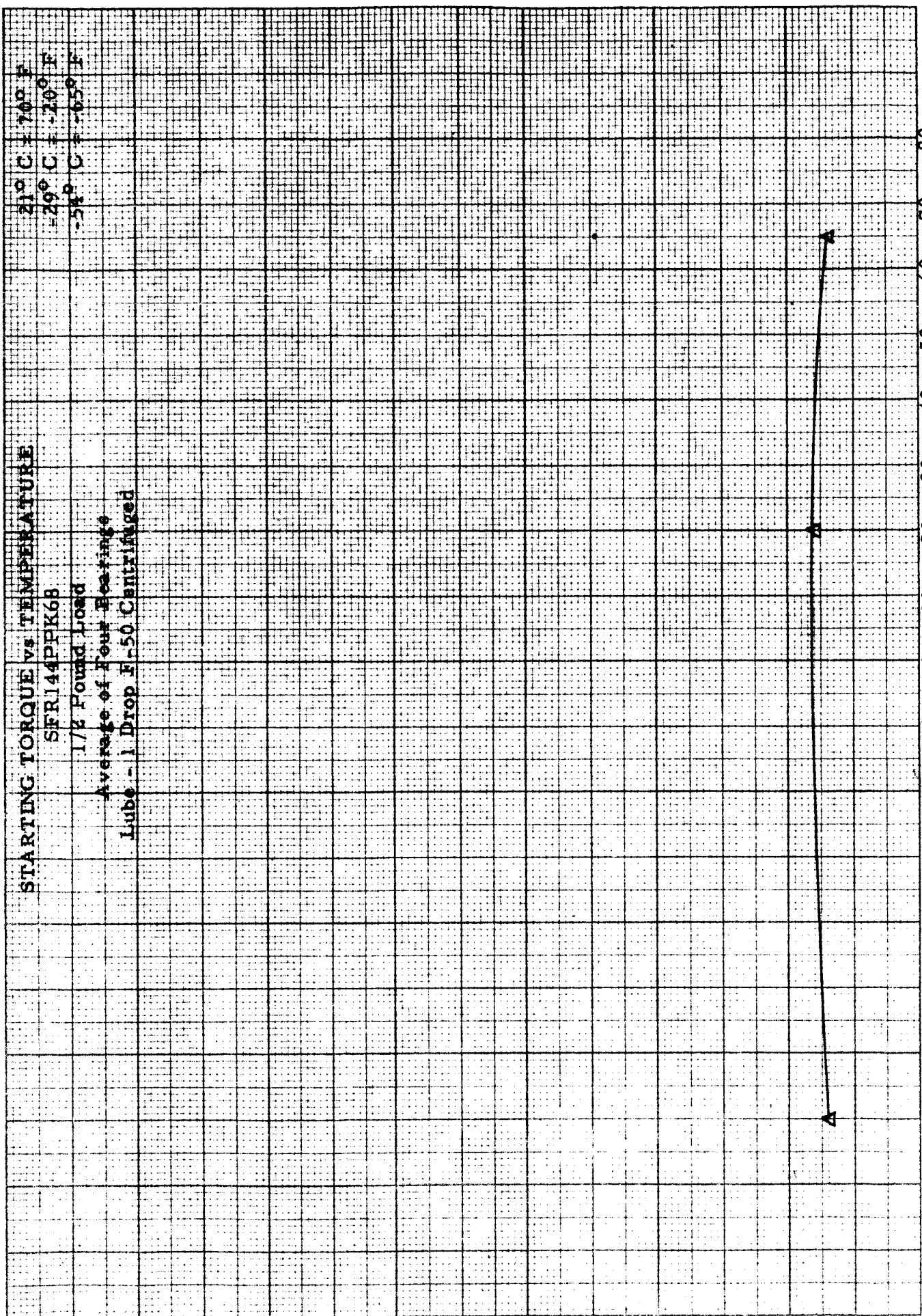
20

TORQUE IN MMG

10

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80

TEMPERATURE IN ° F



TORQUE vs SPEED at VARIOUS TEMPERATURES

SFR144PPK68

1/2 Pound Load

Average of Four Bearings

Lube - 1 Drop F-50 Centrifuged

21°C ----- 70°F
-29°C ----- 20°F
-54°C ----- -65°F

50

40

30

20

10

TORQUE IN MG

0

3000

1000

6000

10000

SPEED IN RPM

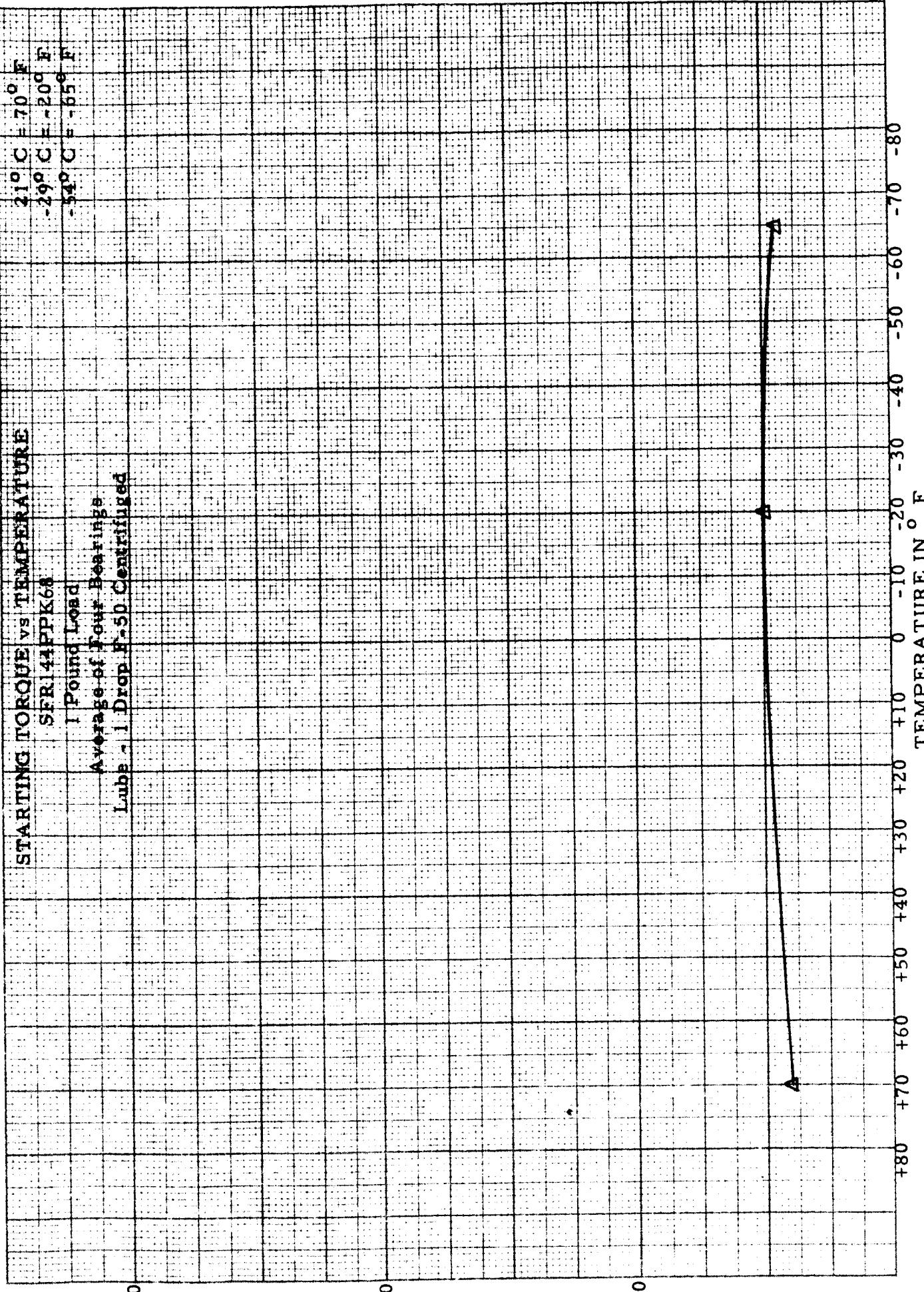
STARTING TORQUE vs TEMPERATURE

SER. 44 FPK68

1 Pound Load

Average of Four Bearings

Lub. - 1 Drop F-50 Centrifuged



NO. 2100 SEMCOGRAPH PAPER
50 X 10 PER HALF INCH

SPALDING MOSS COMPANY
BOSTON 10, MASS.
MADE IN U. S. A.

TORQUE VS SPEED at VARIOUS TEMPERATURES

SER144PPK68

Pound Load

Average of Four Bearings

Lube - 1 Drop P-50 Centrifuged

21°C.....70°F

-29°.....-20°F

-54°.....-62°F

50

40

30

20

10

0

TORQUE IN MCG

1000

3000

6000

10000

SPEED IN RPM

STARTING TORQUE vs TEMPERATURE

SFR 14 PPK 68

2 Pound Load

Average of Four Readings
Lube = 1 Drop F - 50 Centrifuged

30

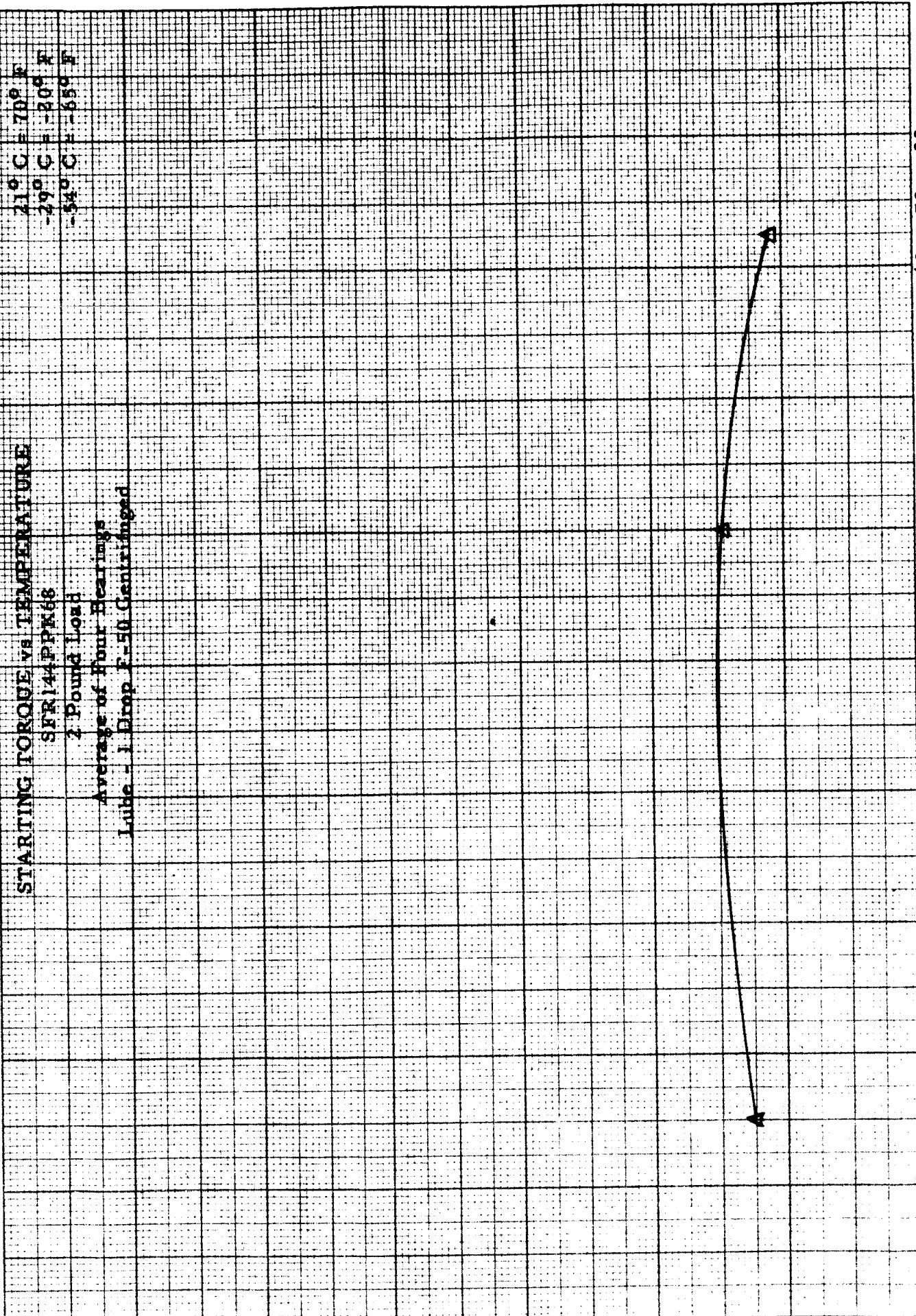
20

10

10

TORQUE IN MMG

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80
TEMPERATURE IN ° F



NO. 2100 SHAWCO GRAPH PAPER
10 X 10 PER HALF INCH

SPALDING-MOSS COMPANY
BOSTON 10, MASS.
MADE IN U. S. A.

TORQUE vs SPEED at VARIOUS TEMPERATURES

SFR144PPK68

2 Pound Test

Average of Four Bearings

Lube - 1 Drop F-50 Centrifuged

70° F

21° C

-20° F

-20° C

-56° F

-46° C

-66° F

-60° C

-86° F

-50° C

-106° F

-60° C

-146° F

-80° C

-186° F

-100° C

-246° F

-130° C

-406° F

-200° C

-746° F

-400° C

-1046° F

-500° C

-1946° F

-1000° C

-3946° F

-2000° C

-6946° F

-3000° C

-11946° F

-5000° C

-21946° F

-10000° C

10000
6000
3000
0
SPEED IN RPM

TORQUE IN MCG

1000 2000 3000 4000 5000

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR144PPK68		1/2 Pound Load	Lube - 1 Drop - F-50 Centrifuged			
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10000 RPM
			70°F			
1	3,250		4,750	5,750	6,750	8,500
2	3,000		5,250	6,250	7,250	9,250
3	3,000		4,750	6,750	7,750	10,000
4	4,750		6,750	8,500	9,250	9,250
Avg.	3,500		5,375	6,810	7,750	9,250
			-20°F			
1	4,750		6,500	8,250	9,250	10,000
2	3,000		4,000	5,000	8,500	9,000
3	4,000		5,000	6,000	7,000	9,000
4	4,400		5,750	6,500	7,500	8,250
Avg.	4,040		5,310	6,440	8,060	9,060
			-65°F			
1	3,000		4,000	4,500	4,500	5,500
2	4,000		5,000	5,000	6,000	6,000
3	2,500		4,000	5,000	6,000	8,000
4	4,500		5,500	6,500	7,500	9,500
Avg.	3,500		4,625	5,250	6,000	7,250

Readings are in mg/mm



TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR144PPK68		1 Pound Load		Lube - 1 Drop F-50 Centrifuged		
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10000 RPM
			70°F			
1	4,000		4,750	5,750	6,750	7,500
2	4,000		6,250	7,250	8,000	9,250
3	4,000		5,750	11,000	14,000	21,000
4	5,750		6,750	7,500	9,250	12,000
Avg.	4,440		5,875	7,875	9,500	12,440
			-20°F			
1	4,750		8,250	9,250	12,000	14,500
2	5,000		9,000	10,000	11,000	12,000
3	4,000		8,000	10,000	11,000	14,000
4	6,500		7,500	9,250	10,000	12,000
Avg.	5,060		8,190	9,625	11,000	13,125
			-65°F			
1	4,000		6,500	7,500	8,500	9,500
2	5,000		9,500	10,000	11,000	12,000
3	5,000		7,000	9,000	11,500	13,500
4	4,000		4,500	5,500	7,500	9,500
Avg.	4,500		6,875	8,000	9,625	11,125

Readings are in mgmm



TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR144PPK68		2 Pound Load	Lube - 1 Drop F-50 Centrifuged			
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10000 RPM
			70°F			
1	4,750		8,500	8,500	9,250	11,000
2	5,250		9,250	14,750	15,750	15,750
3	8,750		15,000	20,000	22,000	24,000
4	8,500		9,250	11,000	14,500	16,750
Avg.	6,810		10,500	13,560	15,375	16,875
			-20°F			
1	9,250		10,000	13,000	15,500	17,500
2	5,000		9,000	13,500	18,500	19,500
3	6,000		7,000	9,000	10,000	14,000
4	9,250		16,500	19,000	20,000	21,500
Avg.	7,375		10,625	13,625	16,000	18,125
			-65°F			
1	4,500		6,500	7,500	9,500	11,000
2	6,000		7,500	9,500	12,000	13,000
3	6,000		9,000	11,500	13,500	16,500
4	5,500		7,500	8,500	9,500	11,000
Avg.	5,500		7,625	9,250	11,125	12,875
			Readings are in mgmm			

STARTING TORQUE VS. TEMPERATURE

SPP166PPK68

Average of Four Bearings

Fibre - 1 Drop MIL-E-6085A

▲ - 76-g. load
□ - 400-g. load

12

11

10

9

8

7

6

5

4

3

2

1

TORQUE IN MMCG

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80

TEMPERATURE IN °F

21°C = 70°F

-28°C = -20°F

-54°C = -65°F

■

▲

■

▲

▲

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR166PPK68

1 Drop MIL-L-6085A

Six Starts Per Bearing Under 75-Gram Load

Starts at 70°F

Brg. No.	1	2	3	4	5	6	Avg.
1	3000	3000	4000	4000	4000	4000	3667
2	2000	2000	2000	2000	2000	2000	2000
3	2000	2000	2000	2000	2000	2000	2000
4	3000	3000	3000	3000	3000	3000	3000

Average Total Torque of Four Bearings 2667

at -20°F

1	4000	4000	4500	4500	4500	4500	4333
2	3000	3000	3000	4000	4000	4000	3500
3	4000	4000	5000	5000	5000	5000	4667
4	4500	4500	5500	5500	5500	5500	5167
							Average Total Torque of Four Bearings 4417

at -65°F

1	5500	5500	5500	5500	5500	5500	5500
2	5000	5000	5500	5500	5500	5500	5333
3	4000	4000	4000	5000	5000	5000	4500
4	4500	4500	4500	5500	5500	5500	5000
							Average Total Torque of Four Bearings 5083

Readings are in mgmm

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR166PPK68

1 Drop MIL-L-6085A

Six Starts Per Bearing Under 400-Gram Load
Starts at 70°F

Brg. No.	1	2	3	4	5	6	Avg.
1	5000	5000	5000	5000	6000	6000	5333
2	3000	3000	3000	3000	3000	3000	3000
3	3000	3000	3000	4000	4000	4000	3500
4	5000	5000	5000	5000	5000	5000	5000

Average Total Torque of Four Bearings 4208

at -20°F

1	5000	5000	5000	5000	5000	5000	5000
2	5000	5000	5000	6000	6000	6000	5500
3	5500	5500	5500	5500	5500	5500	5500
4	5000	5000	5000	6000	6000	6000	5500
Average Total Torque of Four Bearings							5375

at -65°F

1	5000	5000	5000	6000	6000	6000	5500
2	5000	5000	6000	6000	6000	6000	5667
3	5000	5000	5000	6000	6000	6000	5500
4	6000	6500	6500	6500	6500	6500	6417
Average Total Torque of Four Bearings							5771

Readings are in mgmm

STARTING TORQUE VS. TEMPERATURE

SPIRLED PPK 68

1/2 Pound Load

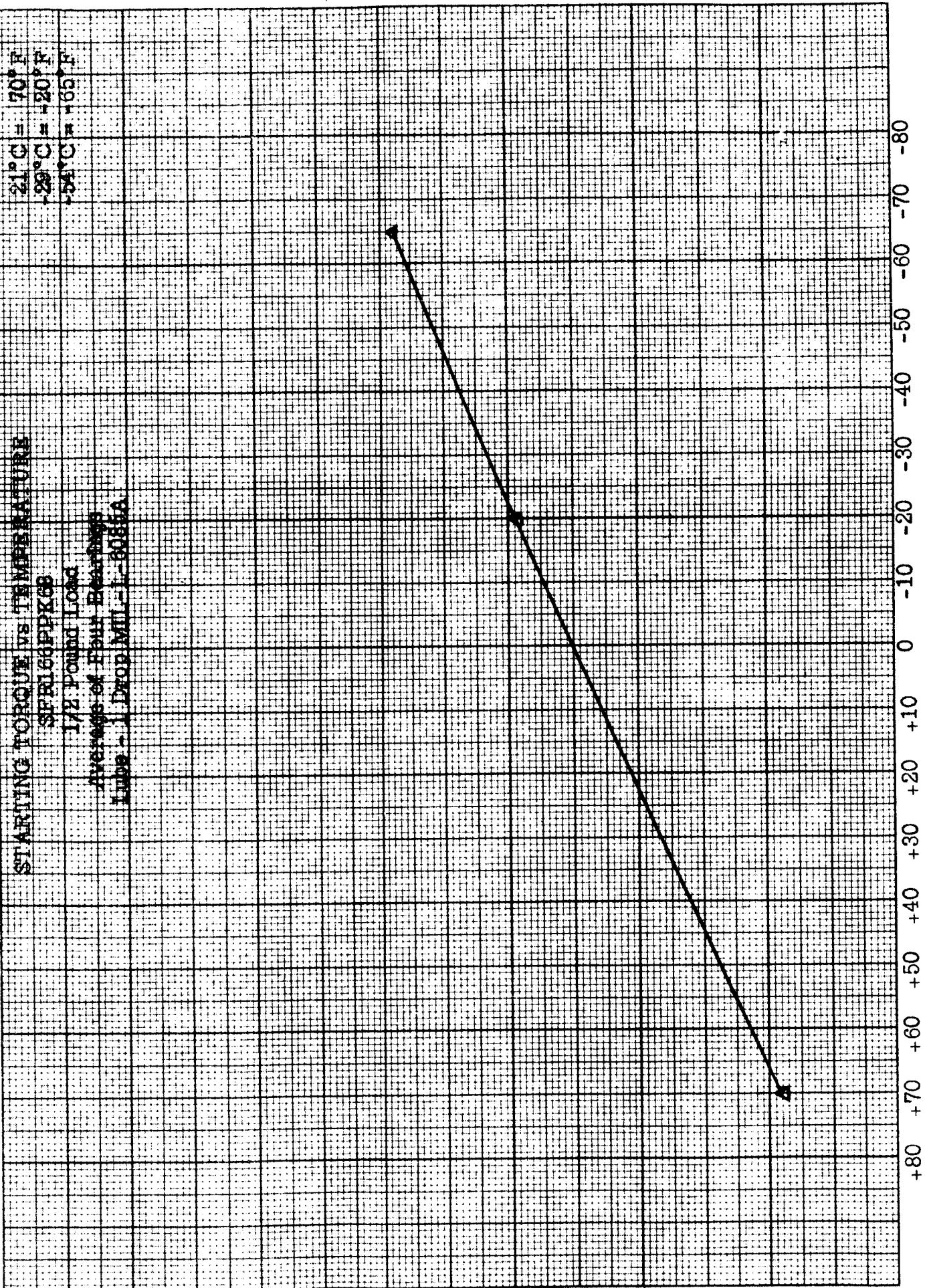
1/2 Pound Load
Time - Drop Mill - 0.08A

30

TORQUE IN MMG

20

10



TORQUE VS SPEED AT VARIOUS TEMPERATURES

SHR 660PK08

1/2 Pound Load

Average of Four Bearings

Lube - 1 Drop MIL-L-6085A

70°C
20°C
0°C

21°C
29°C
64°C

70

60

50

40

30

20

10

0

TORQUE IN MMG

1000
3000
6000
10000

SPEED IN RPM

STARTING TORQUE VS. TEMPERATURE

SPIRGELE PKG

1 Pound Test

Average of Four Readings

Date - 11 Drop Mill - 1938

21°C = 70°F
20°C = 68°F
19°C = 66°F

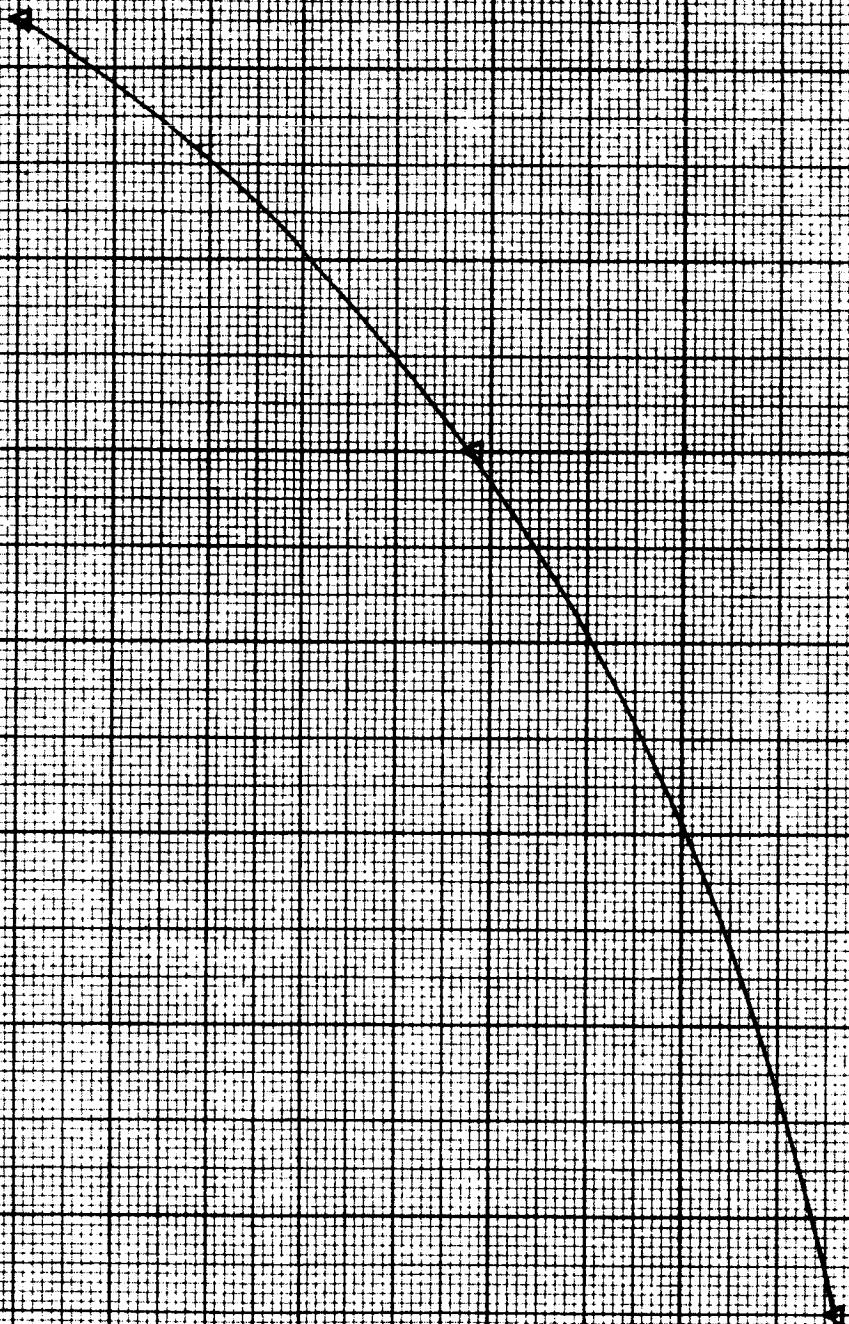
30

20

10

TORQUE IN MMG

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80
TEMPERATURE TN °F



TORQUE vs SPEED at VARIOUS TEMPERATURES

SFR166PPK68

1 Pound Load

Average of Four Bearings

Lube - Drop MIL-L-6085A

21 °C 70 °F
28 °C 80 °F
54 °C 65 °F

70

60

50

40

30

20

10

0

TORQUE IN MMG

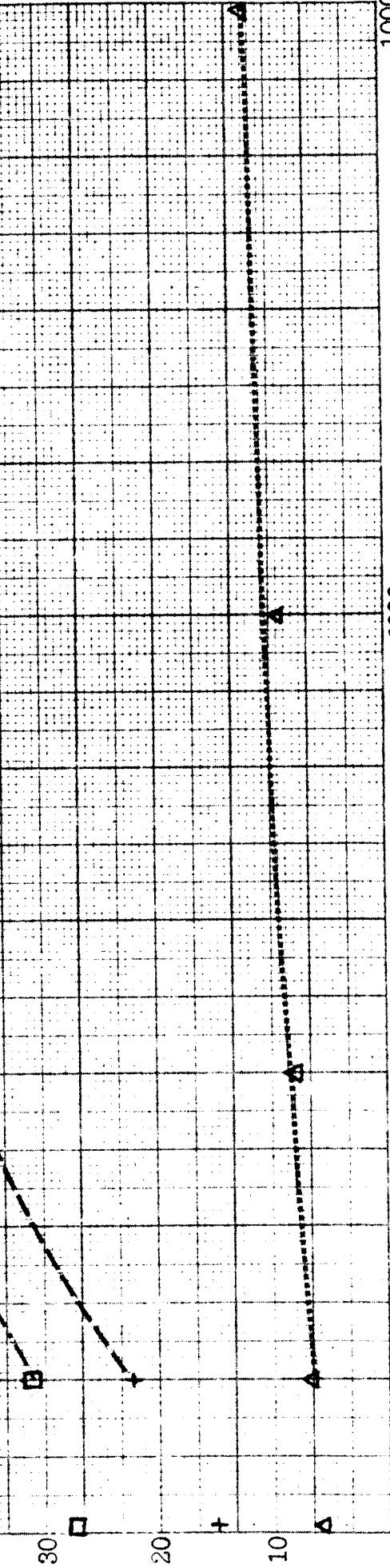
1000

3000

6000

10000

SPEED IN RPM



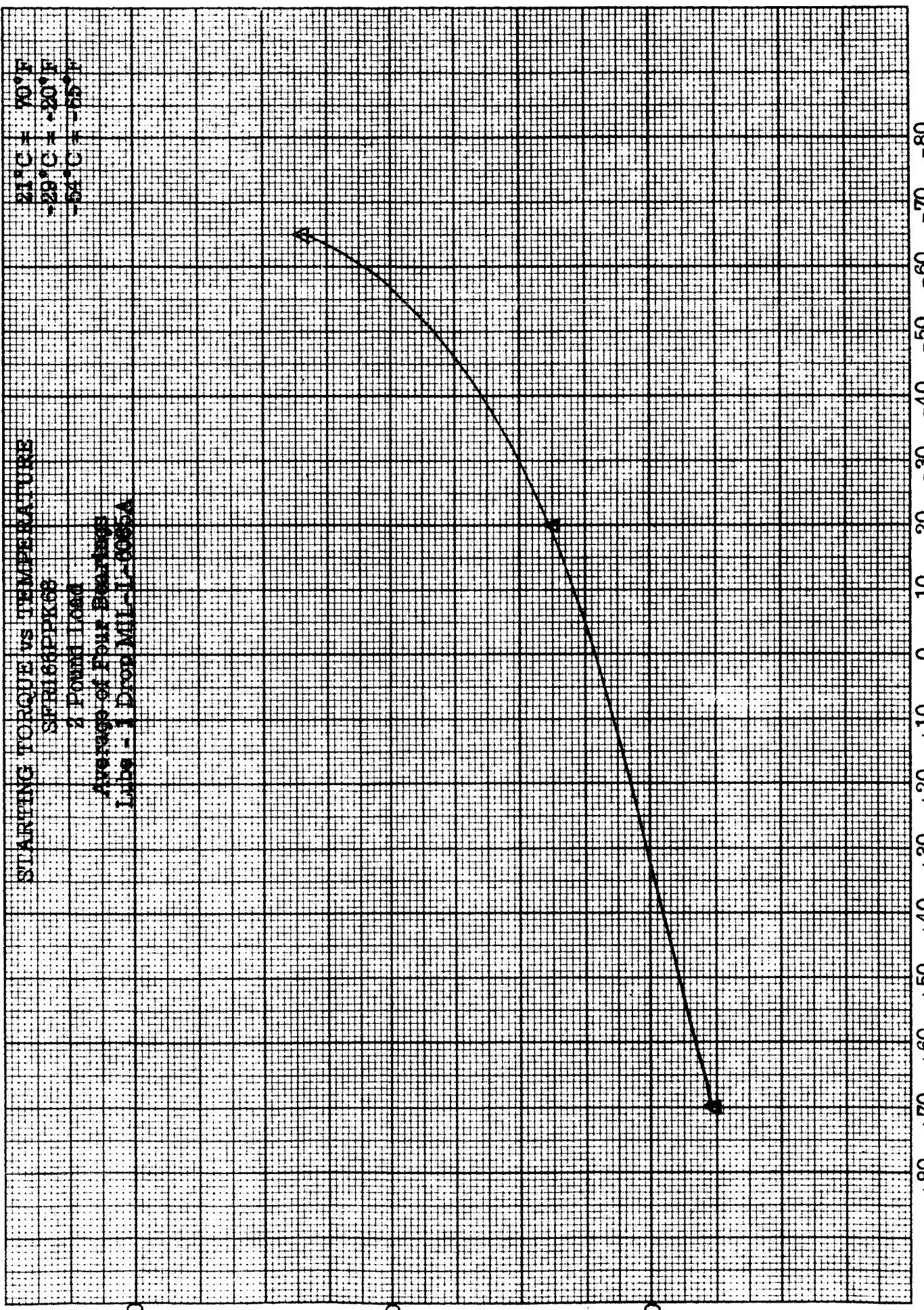
STARTING TORQUE VS TEMPERATURE

SHREWDROP KGS

1 POWER CEM

TESTS OF DOWNSIZING
LINE - 1 Drop In Line A

21°C = 70°F
-20°C = -40°F
-34°C = -30°F



TORQUE VS SPEED AT VARIOUS TEMPERATURES

SFR168PPX68

2 Pound Load

Average of Four Bearings

Type - 1 Drop Mill-L-30864

70°F
21°C
20°F
29°C
68°F
54°C

70

60

50

40

30

20

10

TORQUE IN MMG

10000
6000
3000
1000
0

10000
6000
3000
1000
0

SPEED IN RPM

10000

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR166PPK68		1/2 Pound Load		Lube - 1 Drop MIL-L-6085A		
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10000 RPM
			70° F			
1	4,000		4,000	6,000	7,500	12,500
2	3,500		3,500	5,000	7,000	9,000
3	5,000		6,000	6,000	8,000	8,000
4	5,500		5,500	5,500	7,500	9,500
Avg.	4,500		4,750	5,625	7,500	9,750
			-20° F			
1	18,000		17,000	37,000	45,000	51,000
2	17,500		19,500	31,500	45,500	58,000
3	14,000		18,000	22,000	39,000	49,500
4	19,000		19,000	29,000	35,000	41,000
Avg.	17,125		18,375	29,875	41,125	49,875
			-65° F			
1	16,000		20,000	25,000	28,500	36,500
2	18,000		24,000	30,000	38,000	47,000
3	21,000		34,000	36,000	42,000	46,000
4	23,000		29,000	35,000	37,000	42,000
Avg.	19,500		26,750	31,500	36,375	42,875

Readings are in mgmm



TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR166PPK68		1 Pound Load		Lube - 1 Drop MIL-L-6085A		
BRG. NO.	STARTING	1000 RPM	3000 RPM	6000 RPM	10000 RPM	
		70° F				
1	7,500	9,500	9,500	11,000	18,000	
2	5,000	7,000	7,000	9,000	11,000	
3	6,000	6,000	8,000	10,000	11,000	
4	5,500	5,500	7,500	7,500	9,500	
Avg.	6,000	7,000	8,000	9,375	12,375	
		-20° F				
1	16,000	23,000	49,000	58,000	62,500	
2	15,000	21,500	39,000	53,500	60,000	
3	12,000	18,000	30,000	37,000	43,000	
4	19,000	27,000	35,000	39,000	46,500	
Avg.	15,500	22,375	38,250	46,875	53,000	
		-65° F				
1	36,500	53,000	53,000	55,000	65,000	
2	28,000	32,000	38,000	43,000	57,000	
3	17,000	21,000	32,000	36,000	40,000	
4	29,000	37,000	42,000	45,500	55,000	
Avg.	27,625	31,625	41,250	44,875	54,250	
		Readings are in mgmm				

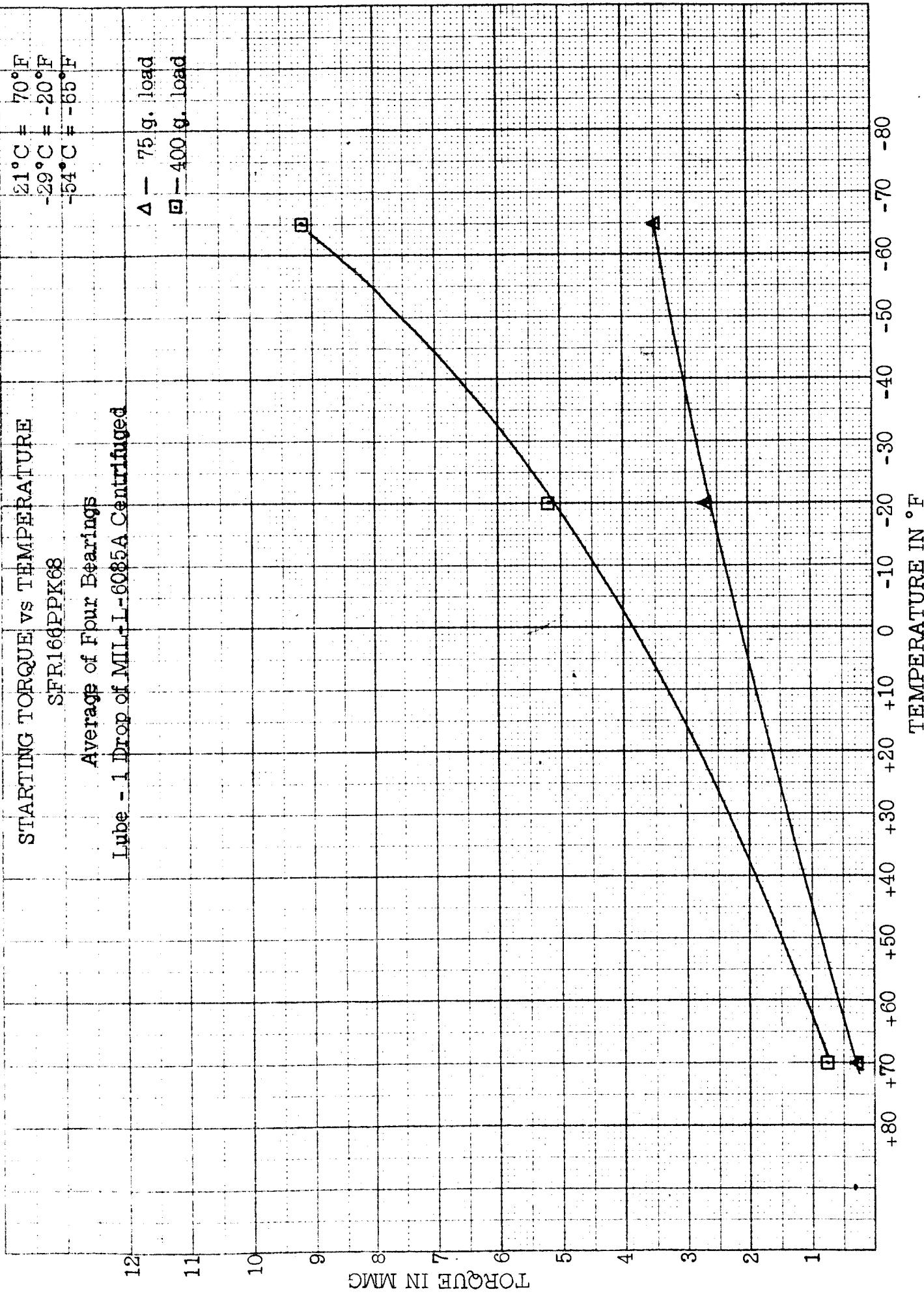


TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR166PPK68		2 Pound Load		Lube - 1 Drop MIL-L-6085A		
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10000 RPM
			70° F			
1	6,000		9,500	9,500	11,000	16,000
2	7,000		11,000	13,000	15,500	19,500
3	8,000		8,000	10,000	11,000	11,000
4	9,500		9,500	11,000	11,000	13,000
Avg.	7,625		9,500	10,875	12,125	14,875
			-20° F			
1	9,000		18,000	17,000	30,000	35,000
2	15,000		29,500	49,500	60,000	65,000
3	12,000		18,000	34,000	39,000	43,000
4	19,000		31,000	39,000	46,500	41,000
Avg.	13,750		24,125	34,875	43,875	46,000
			-65° F			
1	20,000		33,500	42,000	46,000	48,000
2	28,000		38,000	47,000	53,000	57,000
3	17,000		36,000	54,000	56,000	66,000
4	29,000		45,500	55,000	57,000	62,000
Avg.	23,500		38,250	49,500	53,000	58,250

Readings are in mg/mm





TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR166PPK68
MIL-L-6085A Centrifuged
Six Starts Per Bearing Under 75-Gram Load
Starts at 70°F

Brg. No.	1	2	3	4	5	6	Avg.
1							194
2							185
3							165
4							181

Average Total Torque of Four Bearings 181

at -20°F

1	1600	2200	3600	1240	2080	2400	2187
2	1004	1600	2400	2800	2400	1880	2014
3	7040	1880	2080	1600	2400	1880	2814
4	2600	3200	3200	3040	2080	1600	2620
Average Total Torque of Four Bearings							2408

at -65°F

1	3920	2700	1200	2800	3240	2520	2730
2	3760	2400	2600	3240	3400	4600	3334
3	2600	2800	2600	2520	2000	3400	2653
4	6000	6680	4600	5260	4400	6320	5543
Average Total Torque of Four Bearings							3565

Readings are in mgmm

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR166PPK68

MIL-L-6085A Centrifuged

Six Starts Per Bearing Under 400-Gram Load
Starts at 70° F

Brg. No.	1	2	3	4	5	6	Avg.
1							953
2							793
3							770
4							650
							Average Total Torque of Four Bearings 792

at -20° F

1	6080	7440	6600	5200	8720	5200	6540
2	7440	3920	4060	5200	5800	6600	5504
3	9280	8600	7440	5800	5200	8080	7400
4	7440	9280	12720	10800	7440	12720	10667
							Average Total Torque of Four Bearings 7527

at -65° F

1	14000	9600	7960	8400	7600	9600	9527
2	8400	7960	7400	9600	7400	7600	8060
3	9600	11160	9600	7960	8720	9600	9440
4	13800	9600	8400	7960	6720	11160	9607
							Average Total Torque of Four Bearings 9159

Readings are in mgmm

STARTING TORQUE vs TEMPERATURE

SFR 166 PPK 68

1/2 Pound Load

Average of Four Bearings

Lube - 1 Drop M-1-L-6085A Centrifuged

210 C = 70° F
290 C = -20° F
340 C = -65° F

20

TORQUE IN MMG

10

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80
TEMPERATURE IN ° F

TORQUE vs SPEED at VARIOUS TEMPERATURES

SFR166PPK68

1/2 Pound Load

Average of Four Bearings

Lube - MIL-L-6085A Centrifined

21°C

29°C

52°C

70°C

20°F

56°F

86°F

50

40

30

20

10

TORQUE IN MMG

1000

3000

6000

10000

SPEED IN RPM

STARTING TORQUE vs TEMPERATURE

SFR166PPK68

1 Pound Load

Average of Four Bearings

Lube - 1 Drop Mil-L-6085A Centrifuged

21° C = 70° F
-29° C = -20° F
-34° C = -35° F

TORQUE IN MMG

20

10

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80
TEMPERATURE IN ° F

NO. 21010 SEMICOGRAPH PAPER
10 X 10 PER HALF INCH

SPALDING-MOSS COMPANY
BOSTON 10, MASS.
MADE IN U. S. A.

TORQUE vs SPEED at VARIOUS TEMPERATURES

SFRIGGEPPEK68

1 Pound Load

Average of Four Bearings

Lube - MIL-L-6085A Centrifuged

21°C

25°C

29°C

33°C

37°C

50

40

30

20

10

TORQUE IN MMG

1000

3000

6000

10000

SPEED IN RPM

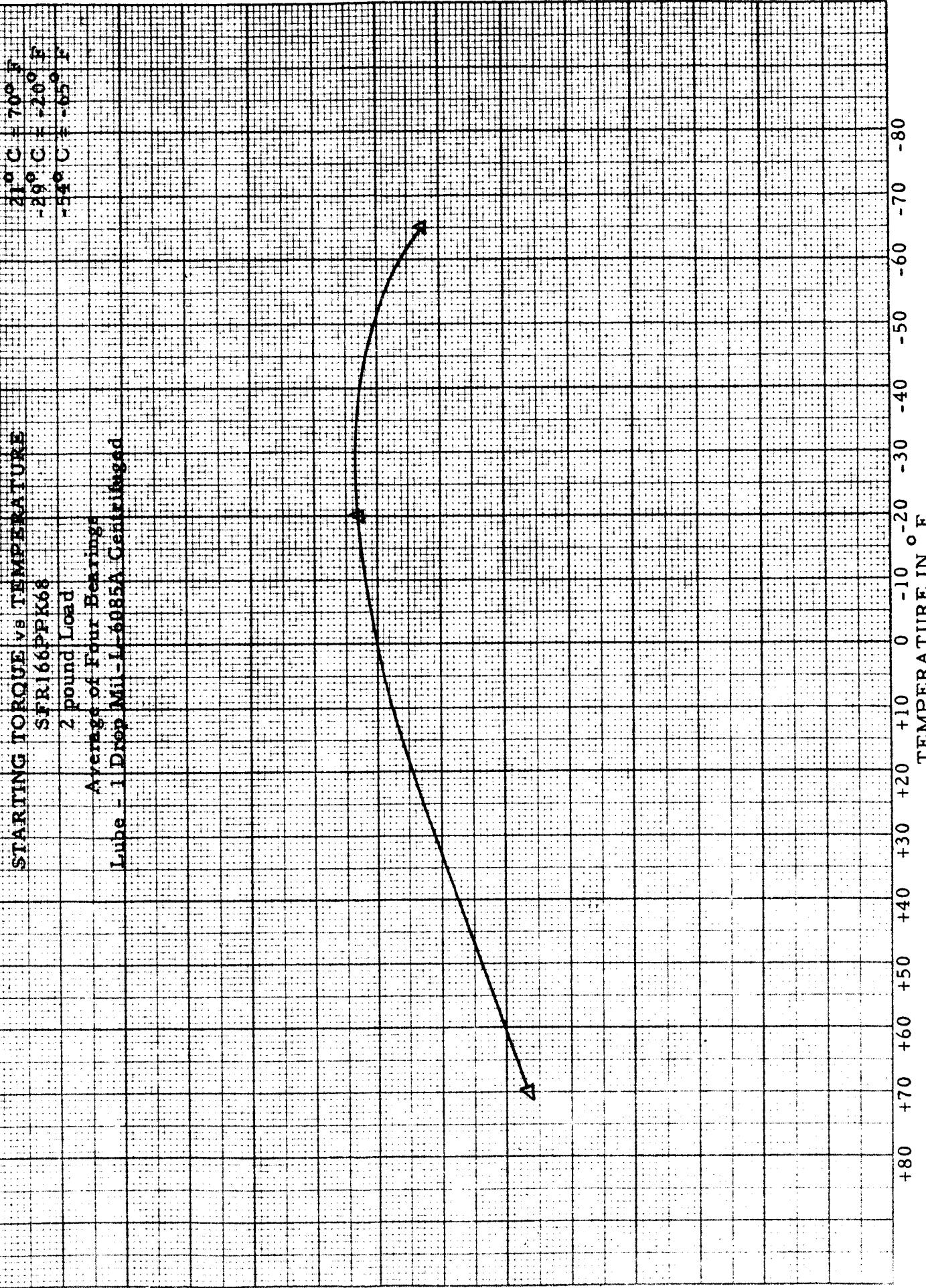
STARTING TORQUE vs TEMPERATURE

SFR166PPK68

2 pound Load

Average of Four Bearings

Lube_1 Drip Mill_L-6085A Centrifuged



TORQUE VS SPEED at VARIOUS TEMPERATURES

SERIAL 6000

2 Pound Head

Average of Four Bearings

Lube - MIL-L-6085A Centrifuged

21°C

29°C

54°C

70°F

20°F

65°F

50

40

30

20

10

TORQUE IN MMG

1000 3000 6000 10000

SPEED IN RPM

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR166PPK68		1/2 Pound Load	Lube - 1 Drop MIL-L-6085A Centrifuged			
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10000 RPM
			70° F			
1	14,500		14,500	18,000	27,000	34,000
2	7,500		7,500	9,500	12,000	13,500
3	10,000		12,000	12,000	13,500	17,000
4	14,000		15,500	17,500	21,500	23,000
Avg.	11,500		12,375	14,250	18,500	21,875
			-20° F			
1	6,000		13,000	13,000	14,500	16,500
2	17,500		38,000	39,500	39,500	41,500
3	10,000		12,000	16,000	18,000	20,000
4	13,000		19,000	19,000	23,000	25,000
Avg.	11,625		20,500	21,875	23,750	25,750
			-65° F			
1	18,000		30,000	31,500	35,000	35,000
2	20,000		30,000	31,500	34,000	36,500
3	25,000		30,500	32,500	37,000	38,000
4	11,500		17,000	17,000	19,000	25,000
Avg.	18,625		26,875	28,125	31,250	33,625

Readings are in mg/mm



TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR166PPK68		1 Pound Load	Lube - 1 Drop MIL-L-6085A Centrifuged			
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10000 RPM
			70° F			
1	18,000		18,000	21,500	25,000	27,000
2	9,500		13,500	15,500	17,500	19,500
3	12,000		12,000	13,500	15,000	17,000
4	14,000		14,000	15,500	17,500	19,000
Avg.	13,375		14,375	16,500	18,750	20,625
			-20° F			
1	18,000		30,500	32,000	34,000	35,500
2	17,500		21,500	23,500	25,500	25,500
3	10,000		12,000	14,000	18,000	20,000
4	17,000		19,000	21,000	23,000	27,000
Avg.	15,625		20,750	22,625	25,125	27,000
			-65° F			
1	26,000		35,000	43,000	44,500	44,500
2	20,000		21,500	23,500	25,500	30,000
3	18,000		20,000	29,000	45,000	46,000
4	21,000		25,000	27,000	29,000	38,000
Avg.	21,250		25,375	30,625	36,000	39,625

Readings are in mNm

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR166PPK68		2 Pound Load	Lube - 1 Drop MIL-L-6085A Centrifuged			
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10000 RPM
			70°F			
1	11,000		16,500	18,000	20,000	21,500
2	13,500		15,500	17,500	19,500	26,000
3	17,000		17,000	19,000	21,000	28,000
4	15,500		15,500	19,000	19,000	21,500
Avg.	14,250		16,125	18,375	19,875	23,000
			-20°F			
1	13,000		16,500	18,000	20,000	21,500
2	17,500		25,500	27,500	27,500	33,500
3	20,000		22,000	24,000	24,000	28,000
4	33,000		35,000	37,000	58,000	69,000
Avg.	20,875		24,750	26,625	32,375	38,000
			-65°F			
1	7,500		9,000	9,000	13,000	17,000
2	30,000		31,500	34,000	37,500	42,000
3	16,000		20,000	21,500	21,500	23,000
4	19,000		52,000	54,000	58,000	60,000
Avg.	18,125		28,125	29,625	32,500	35,500

Readings are in mgmm



STARTING TORQUE VS TEMPERATURE

SERIAL 66PHK68

Average of Four Bearings
1 In. - 1 Prop. - 50

21°C = 70°F
20°C = 68°F
19°C = 65°F
18°C = 62°F
17°C = 59°F
16°C = 56°F
15°C = 53°F
14°C = 50°F
13°C = 47°F
12°C = 44°F
11°C = 41°F
10°C = 38°F
9°C = 35°F
8°C = 32°F
7°C = 29°F
6°C = 26°F
5°C = 23°F
4°C = 20°F
3°C = 17°F
2°C = 14°F
1°C = 11°F
0°C = 8°F
-1°C = 5°F
-2°C = 2°F
-3°C = -1°F
-4°C = -4°F
-5°C = -7°F
-6°C = -10°F
-7°C = -13°F
-8°C = -16°F
-9°C = -19°F
-10°C = -22°F
-11°C = -25°F
-12°C = -28°F
-13°C = -31°F
-14°C = -34°F
-15°C = -37°F
-16°C = -40°F
-17°C = -43°F
-18°C = -46°F
-19°C = -49°F
-20°C = -52°F
-21°C = -55°F

12

11

10

9

8

7

6

5

4

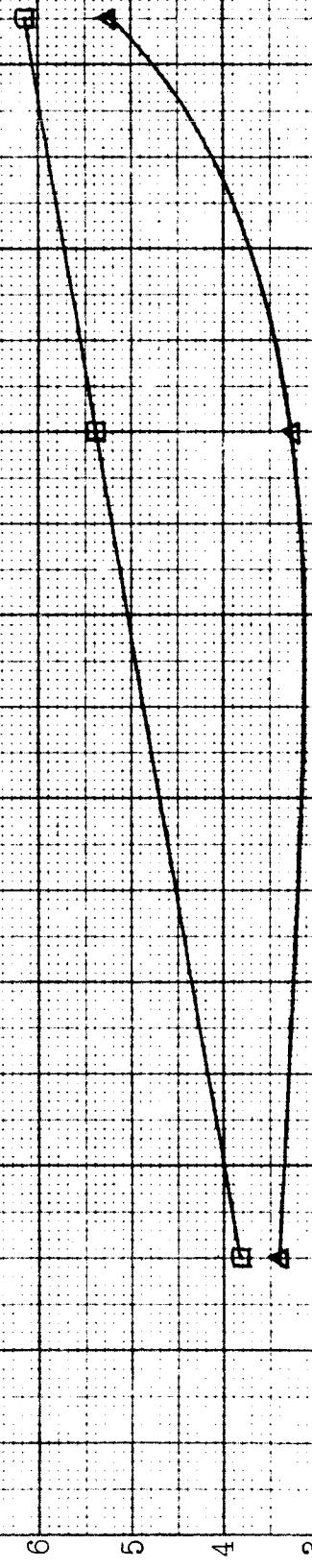
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2

1

TORQUE IN MMCG

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80
TEMPERATURE IN °F



TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR166PPK68

1 Drop F-50

Six Starts Per Bearing Under 75-Gram Load
Starts at 70°F

Brg. No.	1	2	3	4	5	6	Avg.
1	4000	4000	4000	4000	4000	4000	4000
2	3000	3000	4000	4000	4000	4000	3667
3	3000	3000	3000	3000	3000	3000	3000
4	3000	3000	3000	3000	3000	3000	3000
Average Total Torque of Four Bearings							3417

at -20°F

1	3000	3000	3000	3000	3000	3000	3000
2	3000	3000	3000	3000	3000	3000	3000
3	3000	3000	3000	3000	3000	3000	3000
4	4000	4000	4000	4000	4000	4000	4000
Average Total Torque of Four Bearings							3250

at -65°F

1	5000	5000	5000	6000	6000	6000	5500
2	6000	6000	6000	6000	6000	6000	6000
3	4000	4000	4000	4000	4000	4000	4000
4	5000	5000	5000	6000	6000	6000	5500
Average Total Torque of Four Bearings							5250

Readings are in mgmm

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR166PPK68

1 Drop F-50

Six Starts Per Bearing Under 400-Gram Load
Starts at 70° F

Brg. No.	1	2	3	4	5	6	Avg.
1	3000	3000	3000	4000	4000	4000	3500
2	3000	3000	3000	3000	3000	3000	3000
3	4000	4000	4000	4000	4000	4000	4000
4	4000	4000	4000	5000	6000	6000	4833

Average Total Torque of Four Bearings 3833

at -20° F

1	4000	4000	5000	5000	5000	5000	4667
2	5000	5000	5000	5500	5500	5500	5250
3	5500	5500	5500	5500	5500	5500	5500
4	5000	6000	6000	6500	6500	6500	6083
							Average Total Torque of Four Bearings 5375

at -65° F

1	5000	5000	5000	6000	6000	6000	5500
2	6000	6500	6500	7500	7500	7500	6917
3	5500	5500	5500	6000	7000	7000	6083
4	6000	6000	6000	6000	6000	6000	6000
							Average Total Torque of Four Bearings 6125

Readings are in mgmm

STARTING TORQUE vs TEMPERATURE

SFR166PPK68

1/2 Pound Load

Average of Four Bearings

Lube - 1 Drop F-50

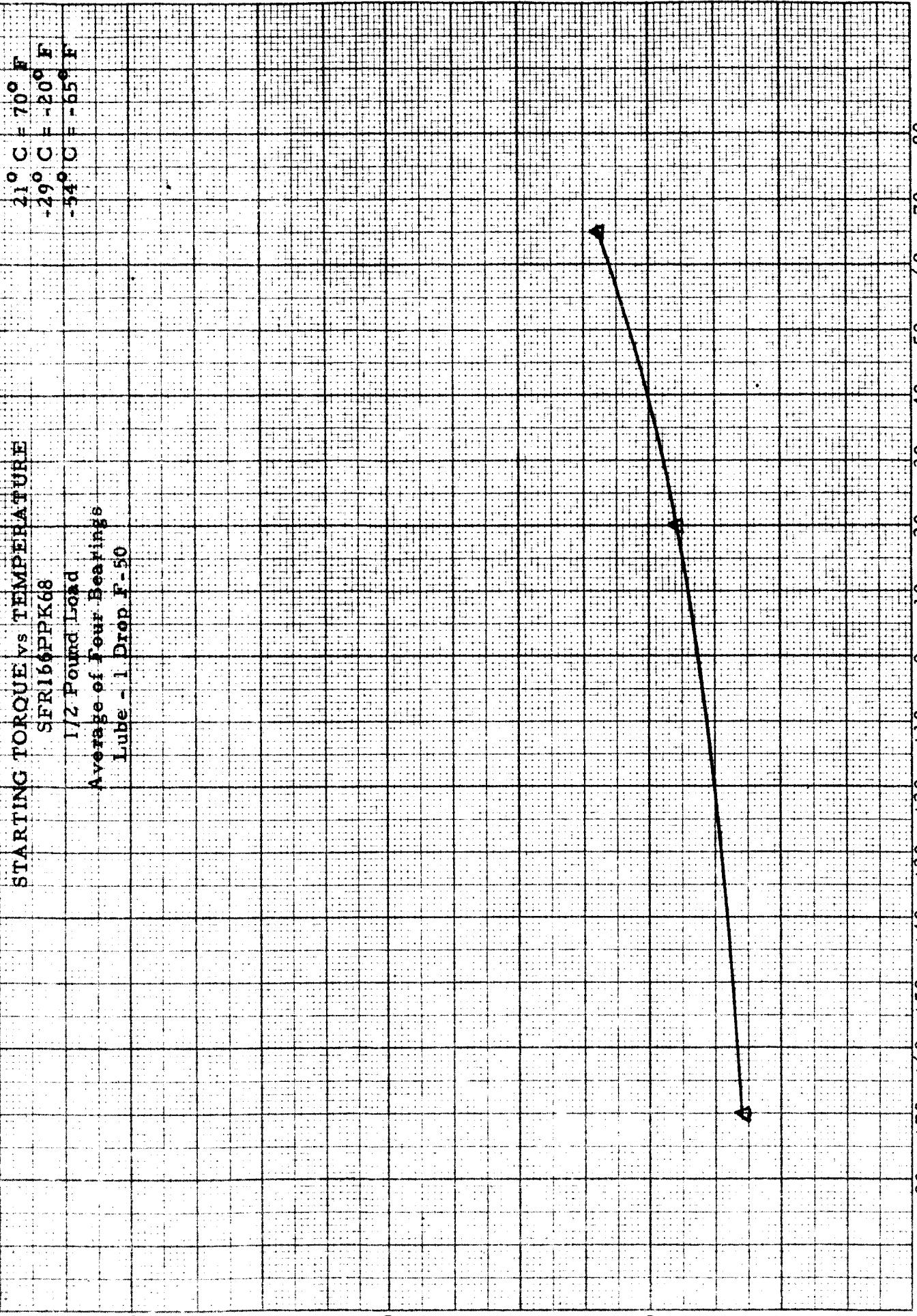
30

20

10

TORQUE IN MMG

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80



TORQUE VS SPEED at VARIOUS TEMPERATURES

STR160PPK68

1/2 Pound Load

Average of Four Bearings

Lube - 1 Drop F-50

21°C

20°F

65°F

54°C

28°C

20°F

70°F

50

40

30

20

10

0

TORQUE IN MCG

0

3000

10000

6000

1000

0

SPEED IN RPM

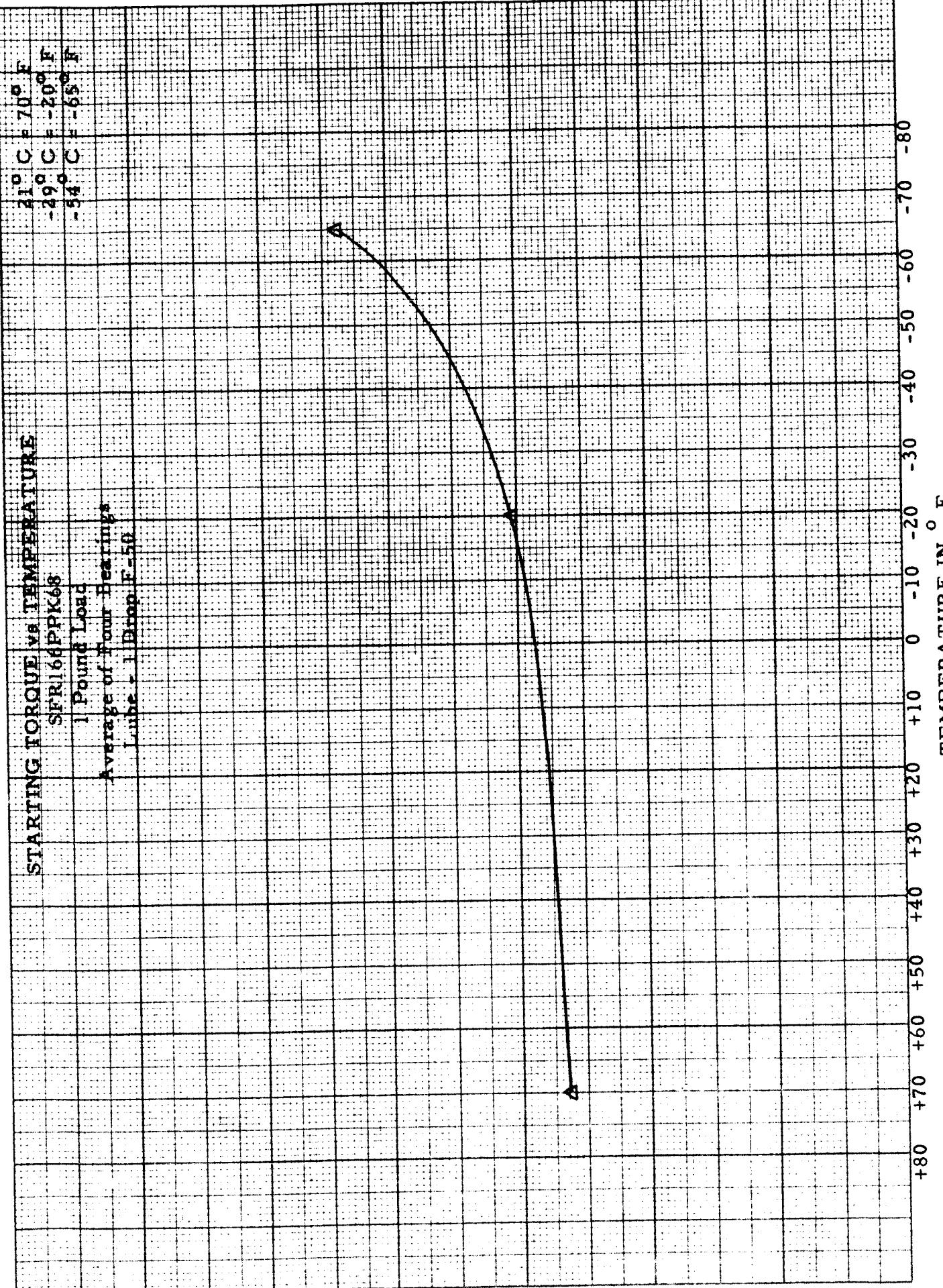
STARTING TORQUE vs TEMPERATURE

SER 16 PPK68

1 Pound Load

Average of Four Bearings

Line - 1 Diron F-50



TORQUE VS SPEED AT VARIOUS TEMPERATURES

STRIKESPPK68

1 TORN 100g

Average of Four Bearings

Tube - 1 Drop F-50

70°F

20°F

65°F

21°C

29°C

34°C

50

40

30

20

10

0

TORQUE IN MMG

1000

3000

6000

10000

SPEED IN RPM

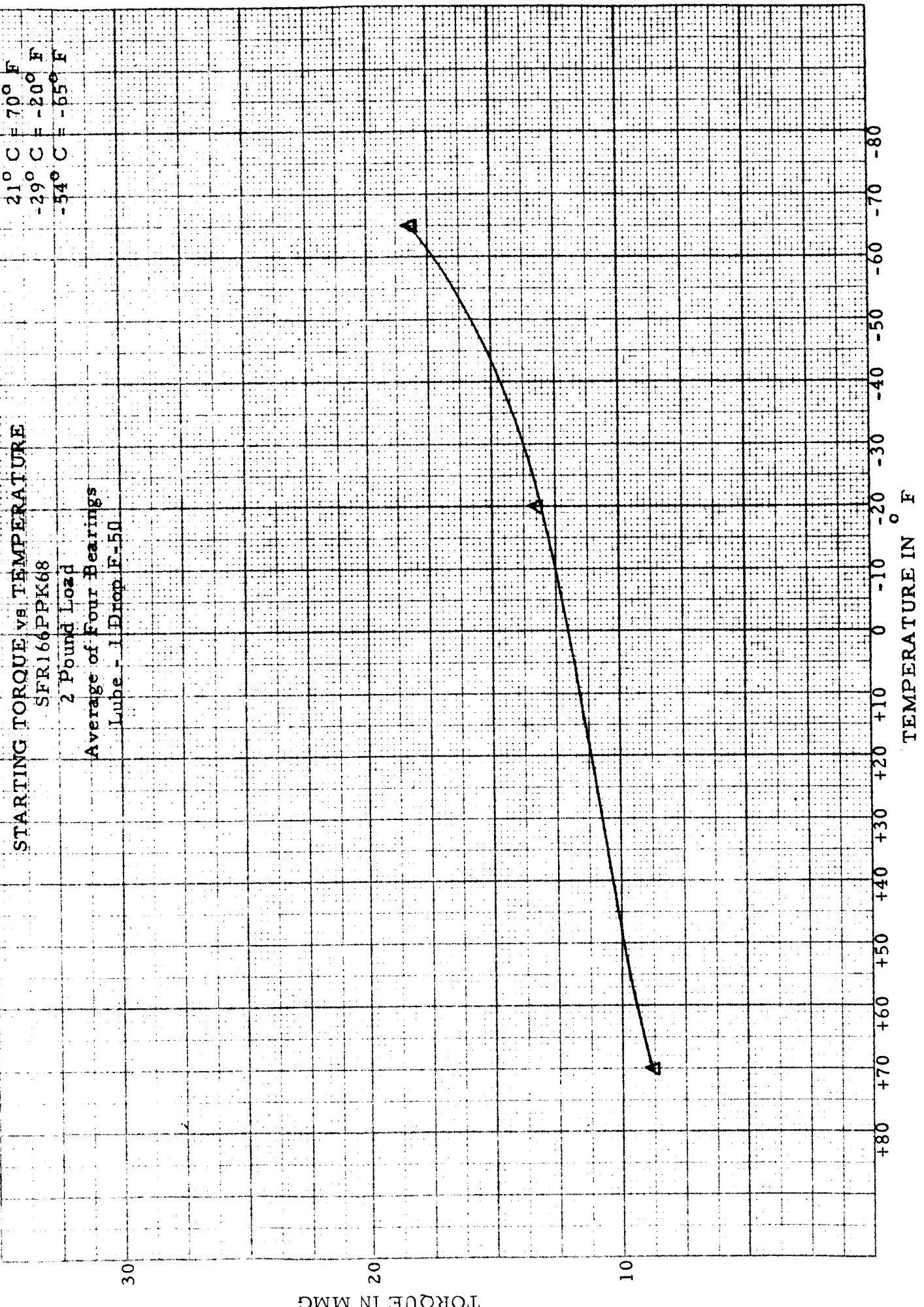
STARTING TORQUE vs TEMPERATURE

SFR166PPK68

2 Pound Load

Average of Four Bearings

Lube - 1 Drop F-50



TORQUE VS SPEED AT VARIOUS TEMPERATURES

SERIAL NO. PEK68

2 Pound Load

Average of Four Bearings

Lube - 1 Drop P-60

21°C Ambient Temperature

29°C

34°C

39°C

44°C

50

40

30

20

10

0

TORQUE IN MMG

1000 3000 6000

10000 SPEED IN RPM

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR166PPK68		1/2 Pound Load		Lube - 1 Drop F-50		
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10000 RPM
			70°F			
1	7,500		11,000	14,500	16,000	19,000
2	7,000		9,000	9,000	11,000	11,000
3	6,000		6,000	8,000	10,000	13,000
4	5,500		5,500	7,500	9,500	11,000
Avg.	6,500		7,875	9,750	11,500	13,500
			-20°F			
1	9,000		18,000	21,000	23,000	26,000
2	7,000		9,000	11,000	13,000	15,000
3	12,000		12,000	15,000	28,000	39,000
4	8,000		8,000	9,000	11,000	17,000
Avg.	9,000		11,750	14,000	18,750	24,250
			-65°F			
1	16,000		20,000	26,000	28,500	36,500
2	11,000		14,000	18,000	22,000	28,000
3	9,000		11,000	16,000	21,000	23,000
4	12,000		14,000	16,000	18,000	21,000
Avg.	12,000		14,750	19,000	22,375	27,125

Readings are in mg/mm

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR166PPK68		1 Pound Load		Lube - 1 Drop F-50		
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10000 RPM
			70° F			
1	7,500		11,000	18,000	19,000	23,000
2	9,000		15,500	17,000	19,500	21,000
3	8,000		10,000	11,000	13,000	17,000
4	11,000		13,000	13,000	15,000	17,000
Avg.	8,875		12,375	14,750	16,625	19,500
			-20° F			
1	11,000		14,500	16,000	18,000	19,000
2	9,000		19,000	21,000	23,000	27,000
3	15,000		17,000	23,000	25,000	27,000
4	18,000		24,000	29,000	32,000	37,000
Avg.	13,250		18,625	22,250	24,500	27,500
			-65° F			
1	20,000		25,000	32,000	33,500	36,500
2	25,000		28,000	38,000	40,000	46,000
3	17,000		19,000	26,000	36,000	42,000
4	11,000		13,000	20,000	23,000	29,000
Avg.	18,250		21,250	29,000	33,125	38,375
			Readings are in mgmm			

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR166PPK68		2 Pound Load		Lube - 1 Drop F-50		
BRG. NO.	STARTING		1000 RPM 70°F	3000 RPM	6000 RPM	10000 RPM
1	18,000		19,000	21,000	25,000	27,000
2	11,000		17,000	19,500	21,000	23,000
3	13,000		15,000	17,000	22,000	28,000
4	11,000		17,000	19,000	20,000	22,000
Avg.	13,250		17,000	19,000	22,000	25,000
			-20°F			
1	11,000		16,000	19,000	21,000	23,000
2	9,000		19,000	29,500	35,000	39,000
3	22,000		39,000	45,000	49,500	60,000
4	19,000		29,000	32,000	35,000	39,000
Avg.	15,250		25,750	31,375	35,125	40,250
			-65°F			
1	20,000		35,000	36,500	46,000	55,000
2	22,000		30,000	32,000	33,500	38,000
3	26,000		27,000	32,000	36,000	46,000
4	20,000		25,000	29,000	33,000	37,000
Avg.	22,000		29,250	32,375	37,125	44,000

Readings are in mgmm

STARTING TORQUE VS TEMPERATURE

SPIR 160P HK 08

Average of Four Bearings

Tube - 1.150" F-25 Cent. In. dia.

21 °C = 70° F
-28 °C = -20° F
-54 °C = -65° F

12 11 10 9 8 7 6 5 4 3 2 1

TORQUE IN MMG

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80
TEMPERATURE IN °F



TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR166PPK68

1 Drop F-50 Centrifuged
 Six Starts Per Bearing Under 75-Gram Load
 Starts at 70° F

Brg. No.	1	2	3	4	5	6		Avg.
1	2000	2000	2000	2000	2000	2000		2000
2	1000	1000	2000	2000	1000	2000		1500
3	2000	3000	2000	3000	2000	3000		2500
4	3000	3000	3000	3000	3000	3000		3000
	Average Total Torque of Four Bearings							2250

at -20° F

1	2000	2000	2000	2000	2000	2000		2000
2	3000	3000	3000	3000	3000	3000		3000
3	3000	3000	3000	3000	3000	3000		3000
4	3000	3000	3000	3000	3000	3000		3000
	Average Total Torque of Four Bearings							2750

at -65° F

1	3000	3000	3000	3000	3000	4000		3167
2	4000	4000	5000	5000	5000	5000		4667
3	3000	3000	3000	3000	4000	4000		3333
4	3000	3000	3000	3000	4000	4000		3333
	Average Total Torque of Four Bearings							3625

Readings are in mgmm

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR166PPK68

1 Drop F-50 Centrifuged

Six Starts Per Bearing Under 400-Gram Load

Starts at 70°F

Brg. No.	1	2	3	4	5	6	Avg.
1	4000	4000	4000	4000	5000	5000	4333
2	3000	3000	3000	3000	3000	3000	3000
3	3000	3000	3000	4000	4000	4000	3500
4	4000	4000	5000	5000	5000	5000	4667
Average Total Torque of Four Bearings							3875
at -20°F							
1	4000	4000	4000	5000	5000	5000	4500
2	5000	5000	5000	5000	6000	6000	5333
3	4500	4500	4500	4500	4500	4500	4500
4	4000	4000	4000	4000	4000	4000	4000
Average Total Torque of Four Bearings							4583
at -65°F							
1	4000	5000	5000	6000	6000	6000	5333
2	5000	6000	6000	6500	6500	6500	6083
3	5500	5500	6000	6000	6000	6000	5833
4	6000	6000	6000	6000	6000	6000	6000
Average Total Torque of Four Bearings							5812
Readings are in mgmm							

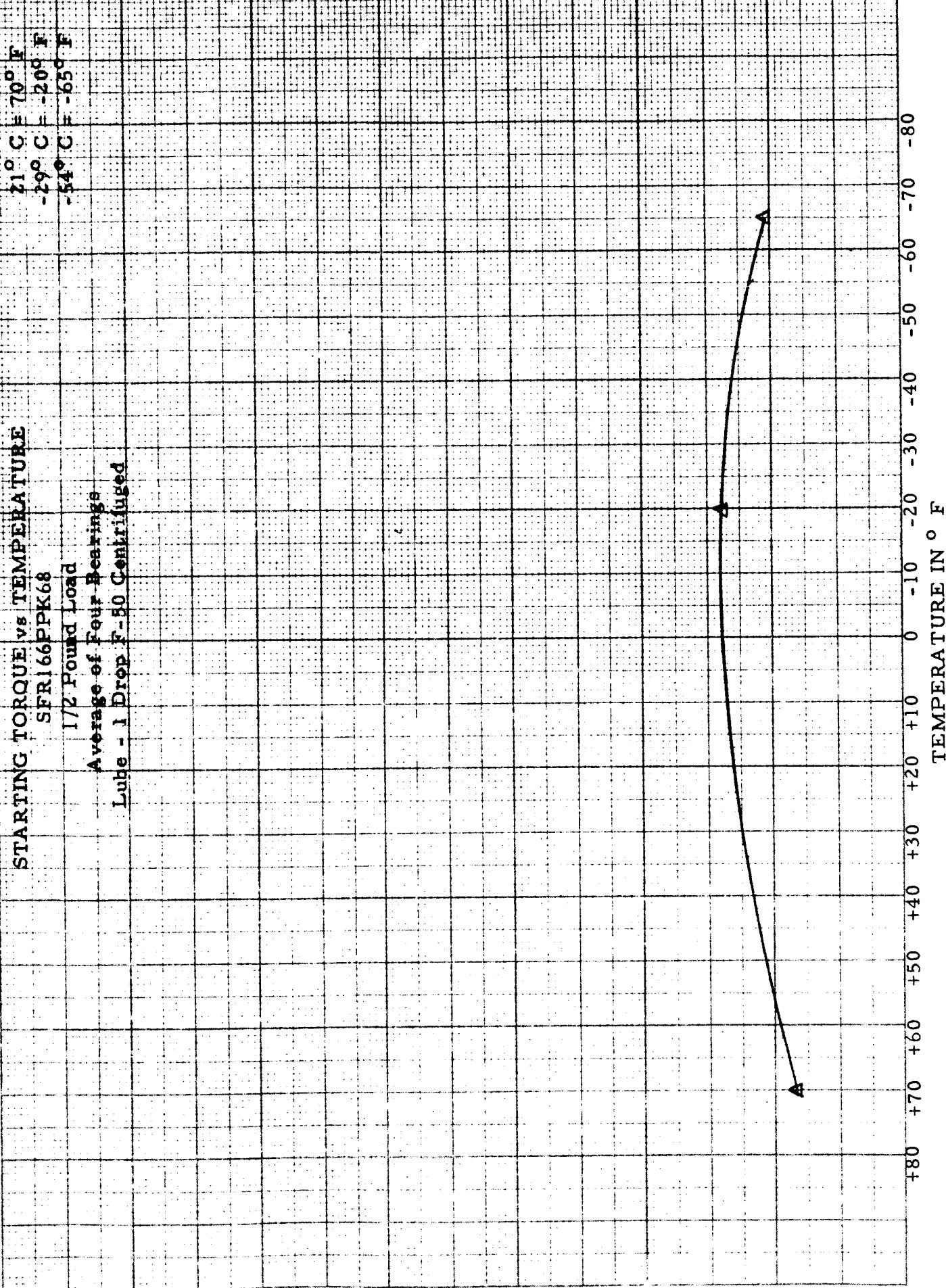
STARTING TORQUE vs TEMPERATURE

SFR 166 PPK 68

1/2 Pound Load

Average of Four Bearings

Lube - 1 Drop F-50 Continued



TORQUE vs SPEED at VARIOUS TEMPERATURES

SFR166PPK68

1/2 Pound Load

Average of Four Bearings

Lube - 1 Drop F-50 Centrifiged

21°C.....
-28°C.....
-54°C.....
65°F.....
70°F.....
20°F.....

50

TORQUE IN MCG

40

30

20

10

1000

3000

6000

10000

SPEED IN RPM

STARTING TORQUE vs TEMPERATURE

SFR166PPK68

1 Pound Load

Average of Four Bearings

Lubricant: 1 Drop F-50 Centrifuged

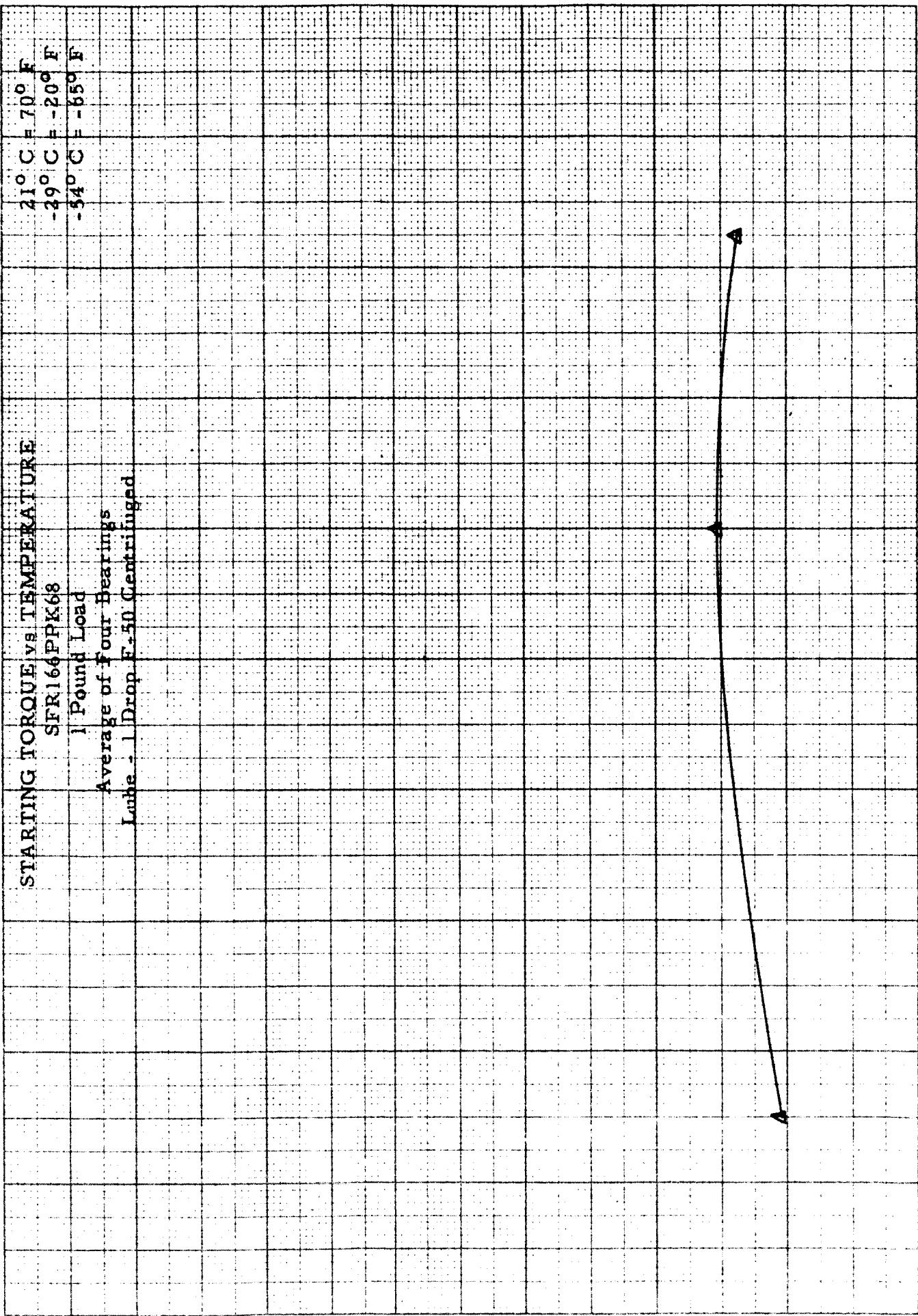
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TORQUE IN MMG

20

10

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80
TEMPERATURE IN ° F



TORQUE VS SPEED at VARIOUS TEMPERATURES

SFR166PPEK68

1 Pound Load

Average of Four Bearings
Lube - 1 Drop F-50 Centrifuged

70° F
21° C
-28° C
-54° C
65° F

50

40

30

20

10

0

TORQUE IN MMG

1000

3000

6000

10000

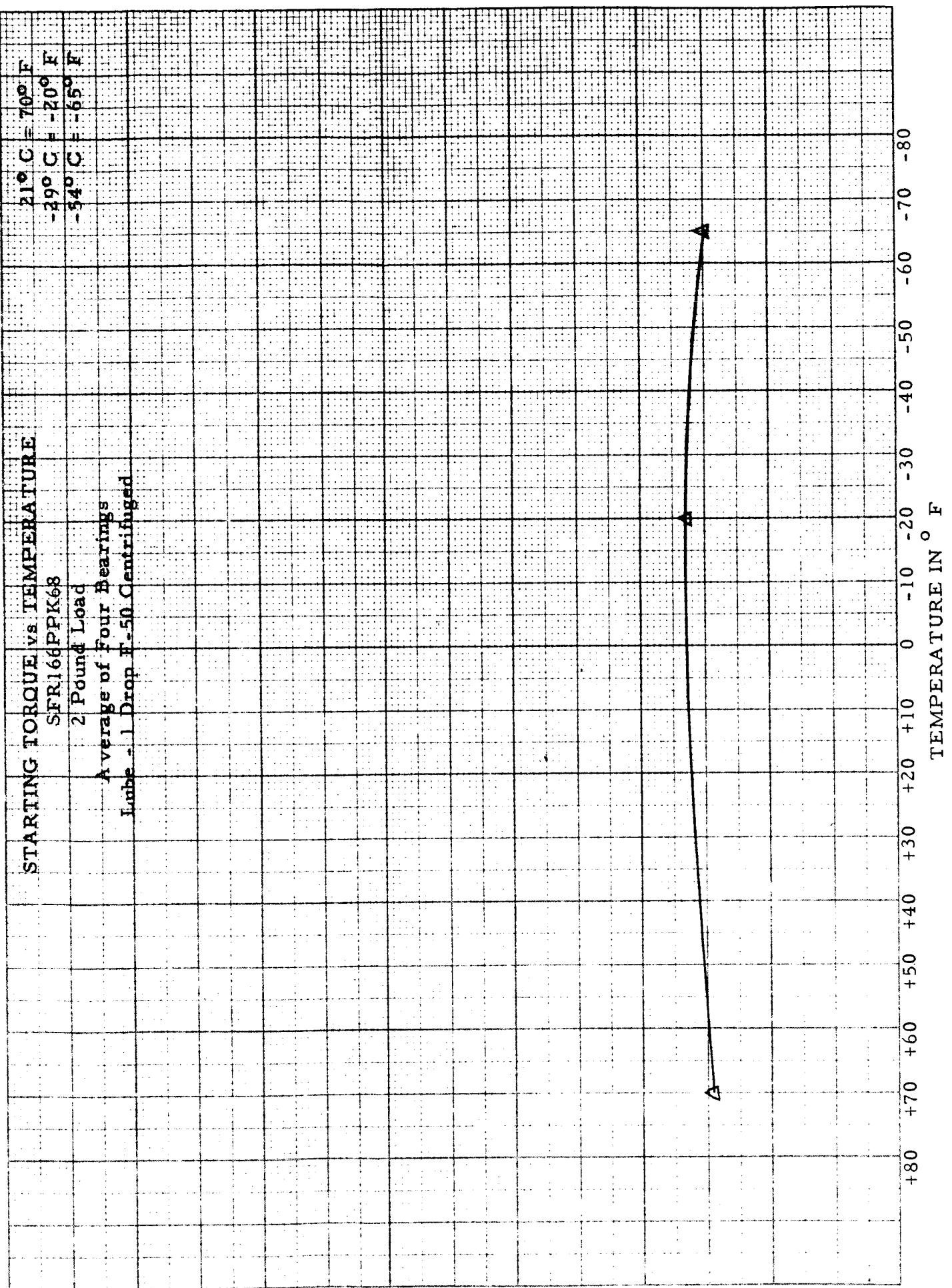
SPEED IN RPM

STARTING TORQUE vs TEMPERATURE

SFR166PPK68

2 Pound Load

Average of Four Bearings
Lubricated - 1 Drop T-50 Centrifuged



TORQUE vs SPEED at VARIOUS TEMPERATURES

SFR160PPK68

2 Pound Load

Average of Four Bearings
Lube - 1 Drop E-50 Centrifuged
70° F
21° C
-20° F
-54° C
-65° F

50

40

30

20

10

TORQUE IN MMG

0

3000

6000

10000

SPEED IN RPM

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR166PPK68		1/2 Pound Load		Lube - 1 Drop F-50 Centrifuged		
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10000 RPM
			70°F			
1	4,000		5,000	5,500	7,500	8,500
2	4,000		6,000	7,000	9,000	11,000
3	4,500		9,000	10,000	12,000	14,000
4	5,000		5,500	6,500	7,500	9,000
Avg.	4,375		6,375	7,250	9,000	10,625
			-20°F			
1	5,500		9,000	10,000	11,000	11,000
2	7,000		9,500	13,500	14,500	15,500
3	8,000		14,000	16,000	17,000	20,000
4	7,500		8,000	9,000	11,000	14,000
Avg.	7,000		10,125	12,125	13,375	15,250
			-65°F			
1	4,500		7,500	8,500	9,000	10,000
2	5,000		9,000	10,000	11,000	12,000
3	6,000		10,000	11,000	12,000	12,500
4	5,500		6,500	7,500	9,000	10,000
Avg.	5,250		8,250	9,250	10,250	11,125

Readings are in mgmm

TORQUE VALUES OF INDIVIDUAL BEARINGS

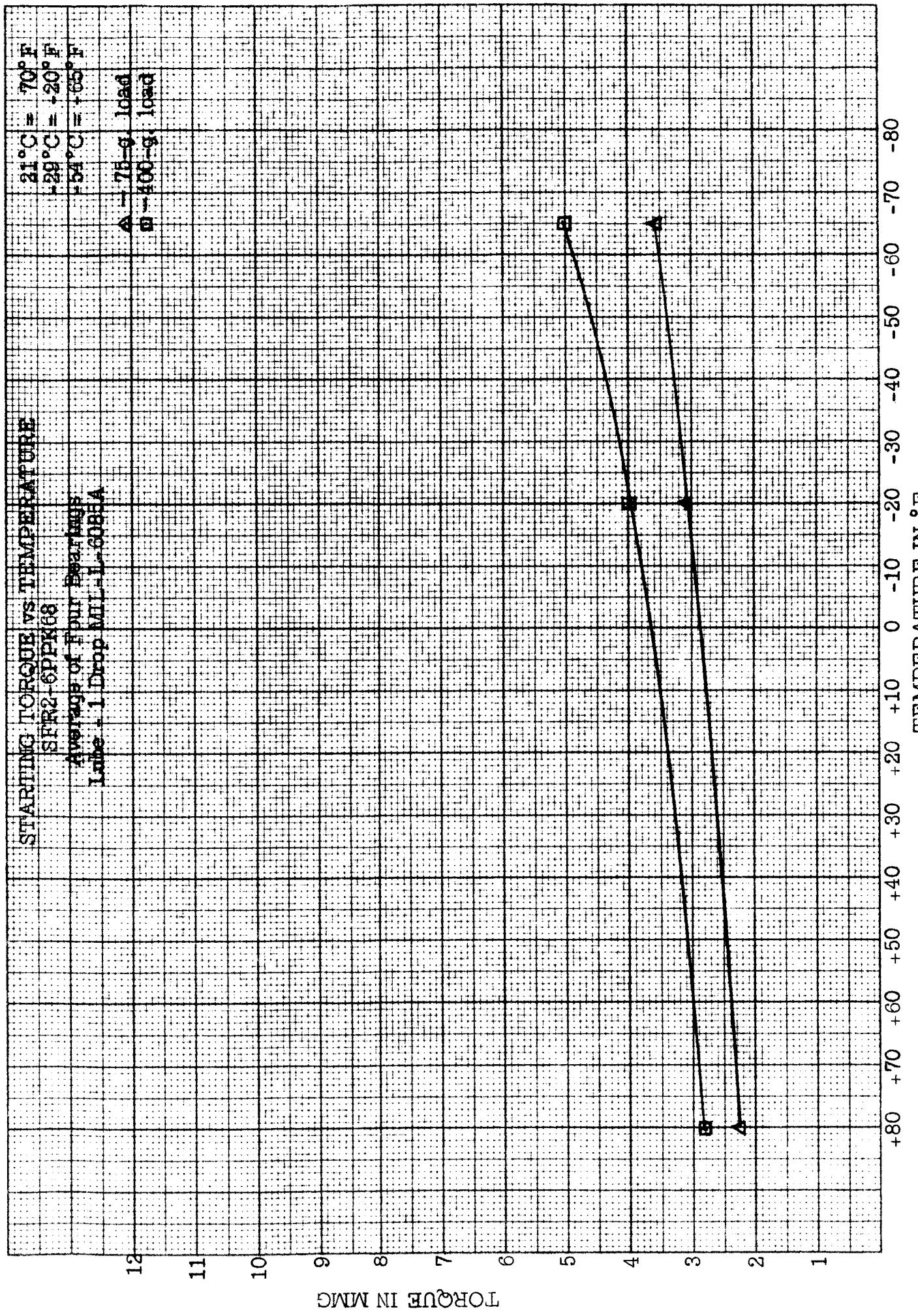
SFR166PPK68		1 Pound Load		Lube - 1 Drop F-50 Centrifuged		
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10000 RPM
			70°F			
1	5,500		7,500	8,500	9,000	10,000
2	4,000		6,000	9,000	10,000	12,000
3	4,500		5,500	8,000	9,000	11,000
4	7,500		8,500	9,000	10,000	15,000
Avg.	5,375		6,875	8,625	9,500	12,000
			-20°F			
1	6,500		8,000	9,000	10,000	12,000
2	8,000		9,500	16,000	19,000	21,000
3	9,000		15,000	19,000	22,000	24,500
4	7,500		9,000	10,000	11,000	12,000
Avg.	7,750		10,375	13,500	15,500	17,375
			-65°F			
1	5,500		9,000	10,000	12,000	14,000
2	7,500		10,000	11,000	14,000	15,000
3	6,000		12,500	13,500	18,000	23,000
4	9,000		11,000	12,000	14,000	19,000
Avg.	7,000		10,625	11,625	14,500	17,750

Readings are in mgmm

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR166PPK68		2 Pound Load	Lube - 1 Drop F-50 Centrifuged						
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10000 RPM			
			70°F						
1	6,500		7,500	8,500	9,000	10,000			
2	9,000		12,000	13,500	17,500	18,500			
3	5,500		18,000	20,000	22,000	24,000			
4	8,500		10,000	16,500	20,000	21,500			
Avg.	7,375		11,875	14,625	17,125	18,500			
			-20°F						
1	7,500		9,000	19,000	20,000	24,000			
2	9,500		14,500	19,000	21,500	23,500			
3	9,000		15,000	16,000	19,000	20,000			
4	7,500		9,000	14,500	18,000	20,000			
Avg.	8,375		11,875	17,125	19,625	21,875			
			-65°F						
1	7,500		11,000	12,000	13,000	14,000			
2	6,500		9,000	14,000	16,000	16,500			
3	9,000		14,500	21,000	24,000	26,000			
4	7,500		10,000	14,000	17,000	19,000			
Avg.	7,625		11,125	15,250	17,500	18,875			

Readings are in mNm



TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR2-6PPK68

1 Drop MIL-L-6085A

Six Starts Per Bearing Under 75-Gram Load
Starts at 70°F

Brg. No.	1	2	3	4	5	6	Avg.
1	2000	2000	2000	2000	2000	2000	2000
2	2000	2000	2000	2000	2000	2000	2000
3	2000	2000	2000	2000	2000	2000	2000
4	3000	3000	3000	3000	3000	3000	3000
	Average Total Torque of Four Bearings						2250

at -20°F

1	2000	2000	2000	2000	3000	3000	2333
2	3000	3000	3000	4000	4000	4000	3500
3	3000	3000	3000	4000	4000	4000	3500
4	3000	3000	3000	3000	3000	3000	3000
	Average Total Torque of Four Bearings						3083

at -65°F

1	3000	3000	3000	4000	4000	4000	3500
2	3000	3000	3000	4000	4000	4000	3500
3	3000	3000	3000	4000	4000	4000	3500
4	3000	3000	3000	4000	4000	4500	3583
	Average Total Torque of Four Bearings						3521

Readings are in mgmm

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR2-6PPK68

1 Drop MIL-L-6085A

Six Starts Per Bearing Under 400-Gram Load
Starts at 70°F

Brg. No.	1	2	3	4	5	6	Avg.
1	3000	3000	3000	3000	3000	3000	3000
2	2000	2000	2000	2000	2000	2000	2000
3	2000	2000	2000	3000	3000	3000	2500
4	3000	4000	4000	4000	4000	4000	3833
Average Total Torque of Four Bearings							2833
at -20°F							
1	3000	3000	3000	4000	4000	4000	3500
2	4000	4000	4000	5000	5000	5000	4500
3	3000	3000	3000	4000	4000	4000	3500
4	4000	4000	4000	4000	5000	5000	4333
Average Total Torque of Four Bearings							3958
at -65°F							
1	4000	4000	4000	5000	5000	5000	4500
2	5000	5000	5000	6000	6000	6000	5500
3	3500	3500	3500	4500	4500	4500	4000
4	6000	6000	6000	6000	6000	6000	6000
Average Total Torque of Four Bearings							5000
Readings are in mgmm							

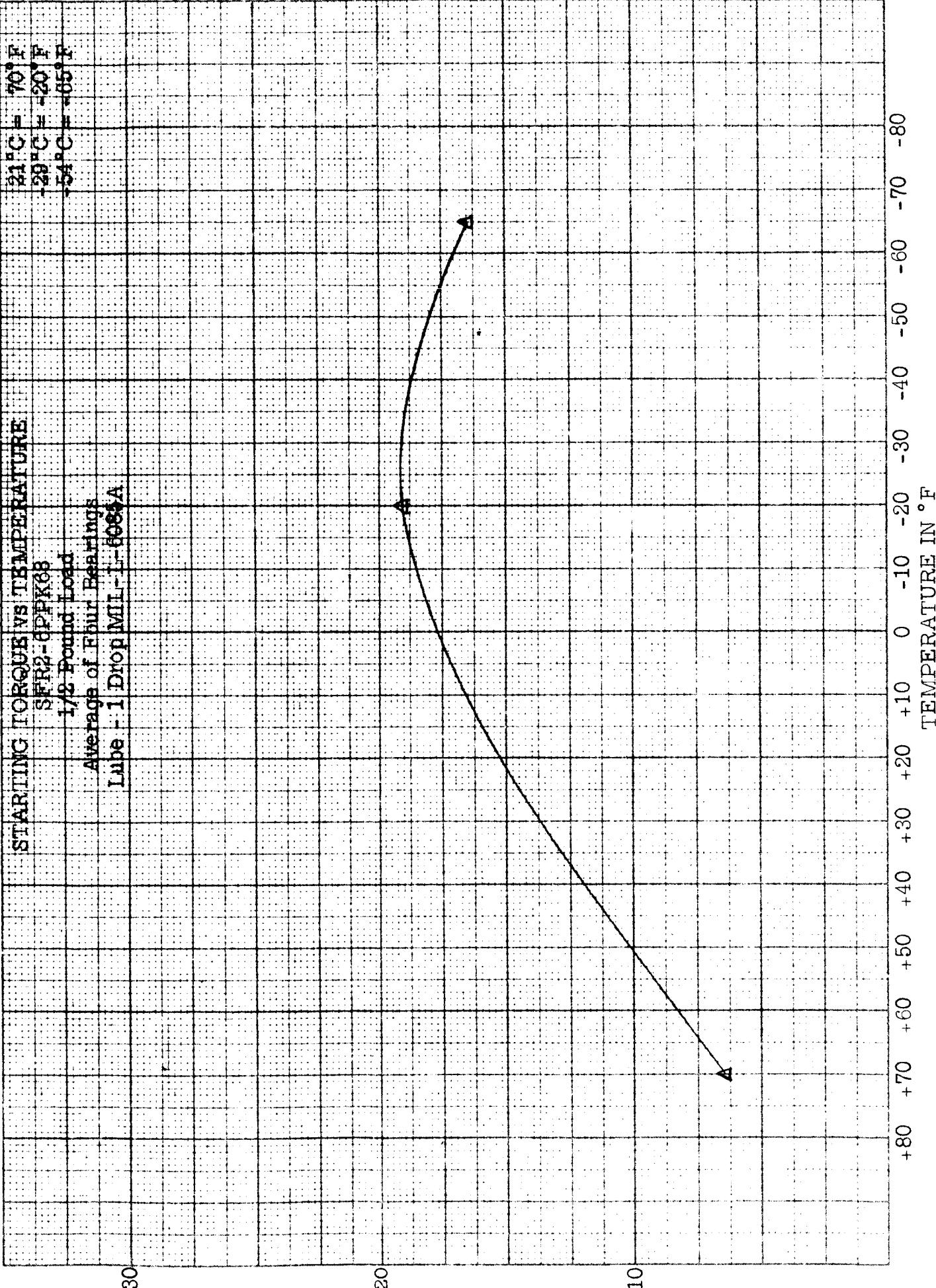
STARTING TORQUE VS TEMPERATURE

SFR2-0PPK68

1/2 Pound Load

Average of Four Bearings

Lube - 1 Drop MIL-T-6088A



TORQUE vs SPEED at VARIOUS TEMPERATURES

SFR2-6PPK68

1/2 Pound Load

Average of Four Bearings
Lube - 1 Drop MIL-L-6085A

70 °F
21 °C
4 °C
-29 °C
-54 °C
-65 °F

70

60

50

40

30

20

10

TORQUE IN MCG

1000
3000
6000
10000

SPEED IN RPM

STARTING TORQUE vs TEMPERATURE

SER2-OPPK68

1 Pound Load

Average of Four Bearings

Lube - 1 Drop MIL-T-0085A

21°C = 70°F

-29°C = -20°F

-54°C = -65°F

TORQUE IN MCG

20

10

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80

TEMPERATURE IN °F

TORQUE VS SPEED at VARIOUS TEMPERATURES

SFR2-ΦPPK68

1 Pound Load

Average of Four Bearings

Lube - 1 Drop MIL-L-6085A

21°C

29°C

54°C

65°F

70°F

20°F

65°F

70

60

50

40

30

20

10

TORQUE IN MMG

1000

3000

6000

10000

SPEED IN RPM

STARTING TORQUE vs TEMPERATURE

SFR2-6PPK68

2 Pound Load

Average of Four Bearings

Lube - 1 Drop MIL-L-6085A

21°C = 70°F
-29°C = -20°F
-54°C = -65°F

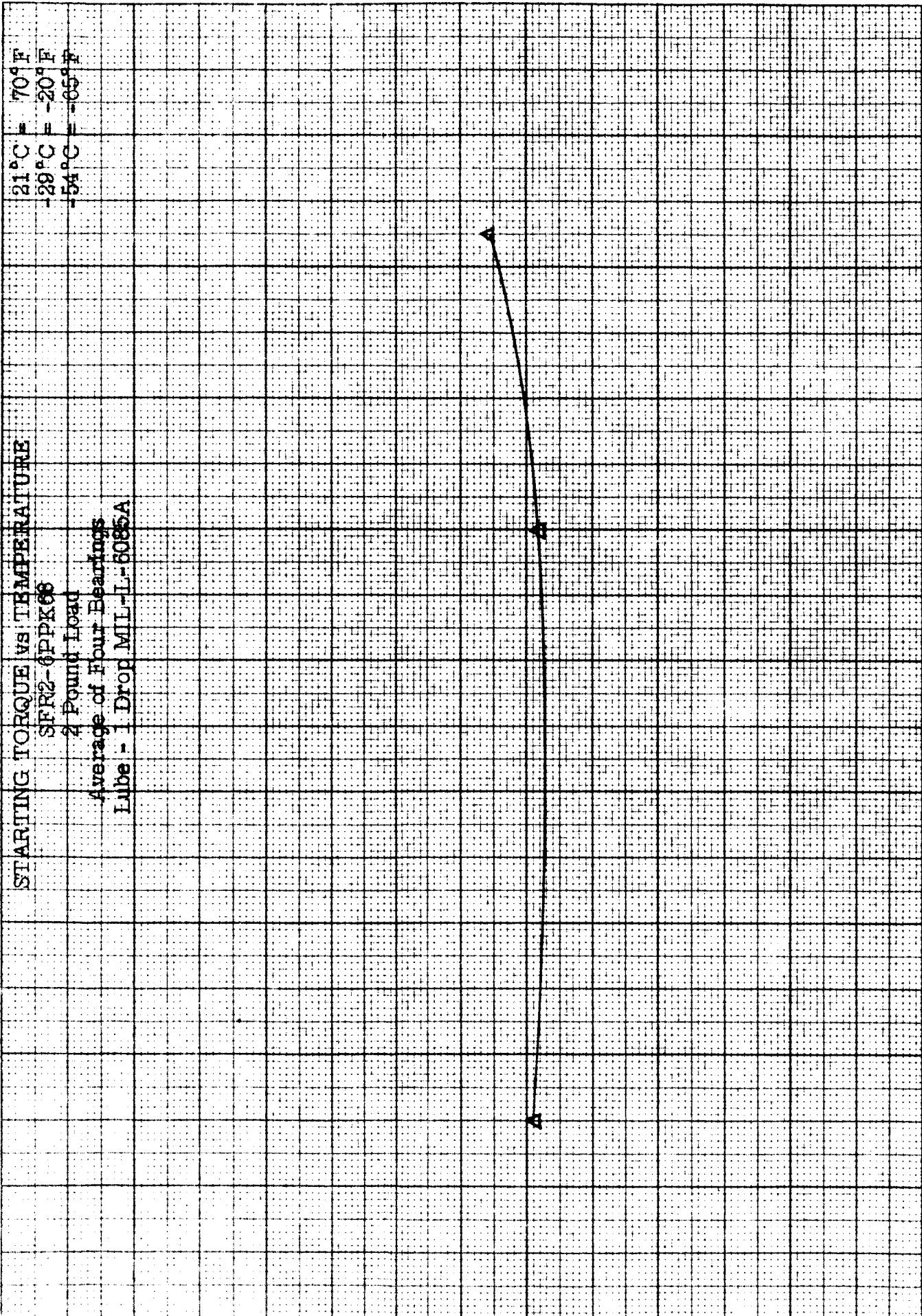
TORQUE IN MMG

20

10

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80

TEMPERATURE IN °F



TORQUE VS SPEED at VARIOUS TEMPERATURES

SFR2-6PPK68

2 Pound Load

Average of Four Bearings

Lube - 1 Drop MIL-L-6085A

70° F
21° C
29° C
54° C
70° F
20° C
65° F

70

60

50

40

30

20

10

TORQUE IN MMCG

0

1000

3000

6000

10000

SPEED IN RPM

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR2-6PPK68		1/2 Pound Load	Lube - 1 Drop Mil-L-6085A			
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10,000 RPM
			70° F			
1	9,000		9,000	11,000	11,000	12,500
2	7,000		9,000	11,500	11,500	13,500
3	4,500		6,500	8,000	10,000	10,000
4	5,500		7,500	9,500	11,000	11,000
Avg.	6,500		8,000	10,000	10,875	11,750
			-20° F			
1	12,500		18,000	27,000	32,000	35,500
2	15,000		29,500	35,500	39,500	50,000
3	20,000		32,000	37,000	43,000	56,000
4	29,000		40,000	44,000	48,500	50,500
Avg.	19,125		29,875	35,875	40,750	48,000
			-65° F			
1	6,000		16,000	26,000	39,000	44,500
2	9,500		43,000	49,500	55,500	60,000
3	29,000		78,000	87,000	95,000	102,500
4	22,000		38,000	54,000	58,000	62,000
Avg.	16,625		43,750	54,125	61,875	67,250

Readings are in mg-mm.

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR2-6PPK68		1 Pound Load		Lube - 1 Drop Mil-L-6085A		
BRG. NO.	STARTING	1000 RPM	3000 RPM	6000 RPM	10,000 RPM	
		70° F				
1	6,000	7,500	7,500	9,000	11,000	
2	15,500	17,500	17,500	21,000	27,500	
3	8,000	11,500	13,000	13,000	13,000	
4	5,500	7,500	9,500	9,500	11,000	
Avg.	8,750	11,000	11,875	13,125	15,625	
		-20° F				
1	9,000	11,000	16,000	21,500	27,000	
2	15,000	17,000	19,000	25,500	39,500	
3	10,000	30,000	35,000	37,000	39,000	
4	9,500	11,000	15,500	17,000	19,000	
Avg.	10,875	17,250	21,375	25,250	31,125	
		-65° F				
1	16,000	20,000	29,500	37,000	39,000	
2	29,500	47,500	49,500	57,500	70,000	
3	38,000	48,500	58,000	78,000	92,000	
4	22,000	24,500	28,500	38,000	60,000	
Avg.	26,375	35,125	41,375	52,625	65,250	

Readings are in mgmm



TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR2-6PPK68		2 Pound Load	Lube - 1 Drop Mil-L-6085A			
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10,000 RPM
			70° F			
1	9,000		12,500	12,500	14,500	16,000
2	27,500		29,500	29,500	33,500	35,000
3	11,500		13,000	13,000	15,000	17,000
4	11,000		17,000	17,000	19,000	19,000
Avg.	14,750		18,000	18,000	20,500	21,750
			-20° F			
1	16,000		18,000	27,000	35,500	45,000
2	11,000		13,000	19,000	29,500	43,500
3	13,500		18,000	20,000	28,000	30,000
4	17,000		21,000	23,000	25,000	27,000
Avg.	14,375		17,500	22,250	29,500	36,375
			-65° F			
1	16,000		26,000	31,000	35,000	41,000
2	19,500		31,000	33,000	45,500	49,500
3	21,000		25,000	29,000	31,000	38,000
4	9,500		17,000	19,000	24,500	28,500
Avg.	16,500		24,750	28,000	34,000	39,250

Readings are in mgmm.



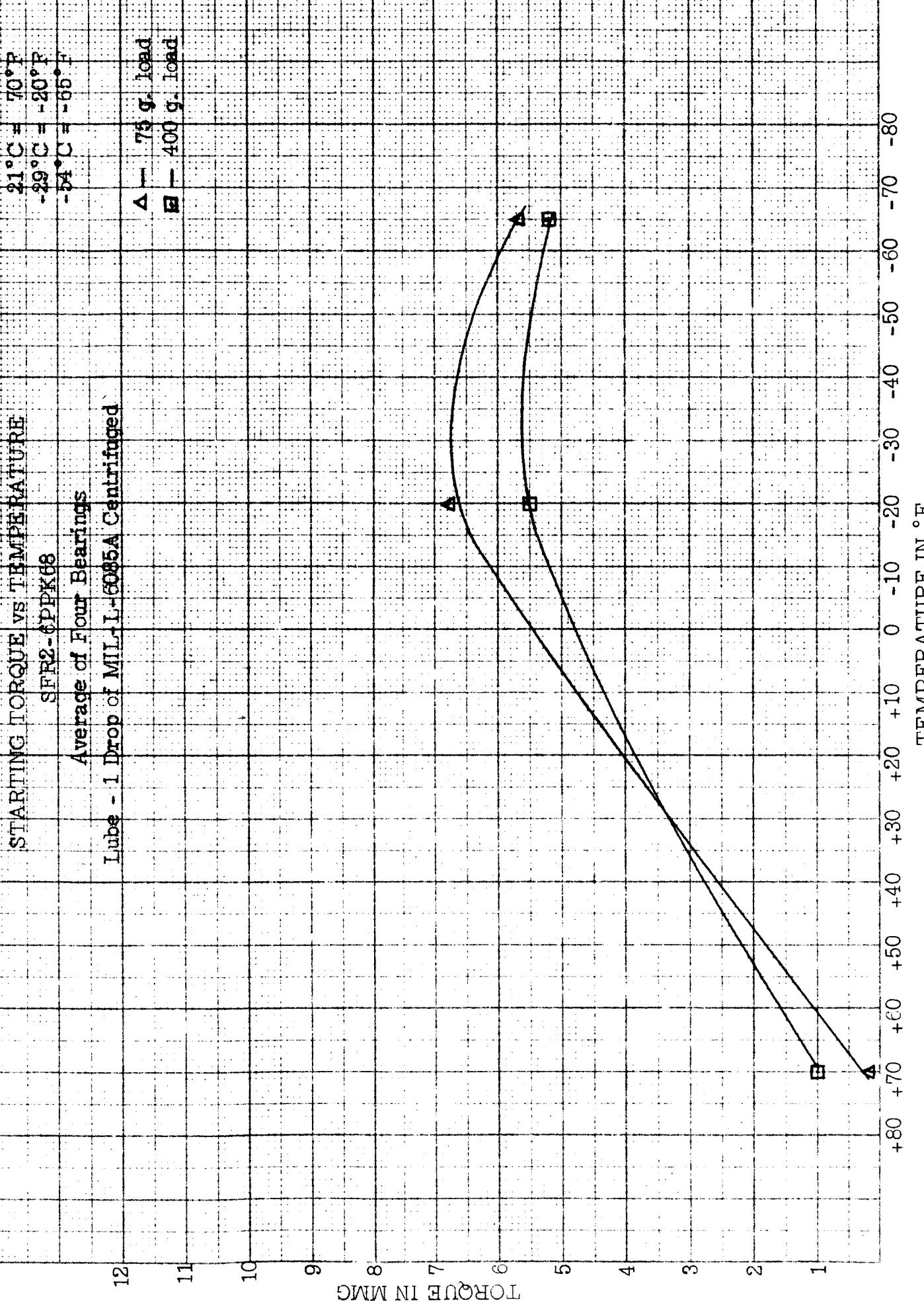
STARTING TORQUE VS TEMPERATURE

SFR2-6PPK68

Average of Four Bearings

Lube - 1 Drop of MIL-L-6085A Centrifuged

▲ - 73 g. load
■ - 400 g. load



TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR2-6PPK68

MIL-L-6085A Centrifuged

Six Starts Per Bearing Under 75-Gram Load
Starts at 70° F

Brg. No.	1	2	3	4	5	6	Avg.
1							159
2							155
3							149
4							159
							Average Total Torque of Four Bearings 156

at -20° F

1	7000	6600	7400	5400	6800	8400	6934
2	7400	8400	7000	9600	6000	5400	7300
3	4400	5400	5160	6600	4800	6800	5527
4	9600	8400	6000	4800	5400	8400	7100
							Average Total Torque of Four Bearings 6715

at -65° F

1	4200	4400	5200	5160	5800	6000	5127
2	6800	6400	5800	5260	5160	6000	5903
3	5200	4400	8400	7200	6800	8400	6734
4	6000	4200	4400	5200	5160	5800	5127
							Average Total Torque of Four Bearings 5723

Readings are in mgmm

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR2-6PPK68

MIL-I-6085A Centrifuged

Six Starts Per Bearing Under 400-Gram Load

Starts at 70° F

Brg. No.	1	2	3	4	5	6	Avg.
1							507
2							630
3							473
4							527

Average Total Torque of Four Bearings 534

at -20° F

1	4480	3200	9240	HU	HU	HU	5640
2	4240	3560	5240	12200	HU	HU	6310
3	8000	6400	5600	2840	10880	HU	6740
4	6400	4240	9240	6000	9240	4480	6600

Average Total Torque of Four Bearings 6322

at -65° F

1	6400	5800	5160	6400	6760	7000	6253
2	5800	3600	6400	4400	4600	4800	4933
3	9800	5600	5160	5600	4600	4800	5926
4	5600	3600	5160	5800	3200	4400	4627

Average Total Torque of Four Bearings 5435

Readings are in mgmm

STARTING TORQUE vs TEMPERATURE

SFR2-6PPK68

1/2 Pound Load

Average of Four Bearings

Lube - 1 Drop Mil-L-6085A Centrifuged

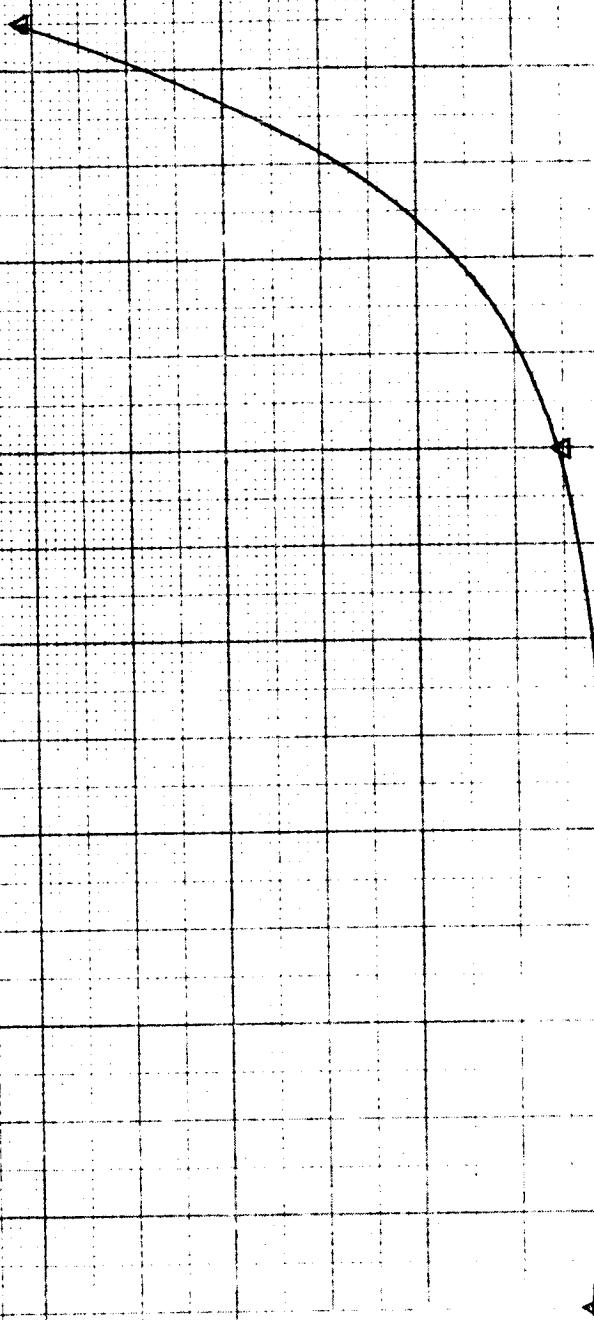
30

TORQUE IN MMG

20

10

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80
TEMPERATURE IN ° F



TORQUE vs SPEED at VARIOUS TEMPERATURES

SFR2-6PPK6B

1/2 Pound Load

Average of Four Bearings
Lube - MIL-L-6085A Centrifuged

21°C — 70°F
29°C - - - 20°F
54°C . . . 65°F

50

40

30

20

10

0

TORQUE IN MMG

1000

3000

6000

10000

SPEED IN RPM

STARTING TORQUE vs TEMPERATURE

SER2-6PPK68

1 Pound Load

Average of Four Bearings

Lube - 1 Drop Mil-L-6085A Centrifuged

30

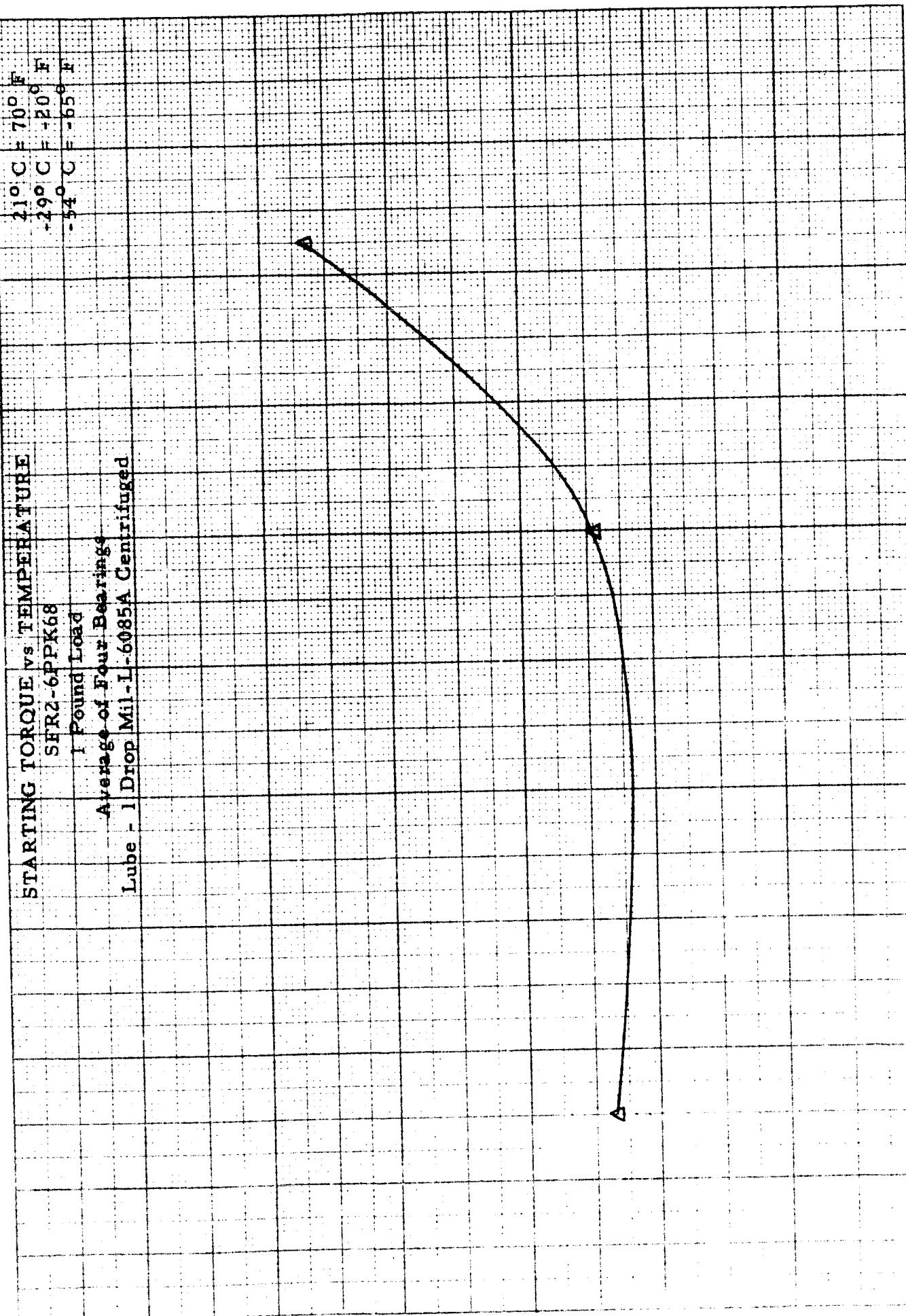
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TORQUE IN MMG

10

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80

TEMPERATURE IN °F



TORQUE vs SPEED at VARIOUS TEMPERATURES

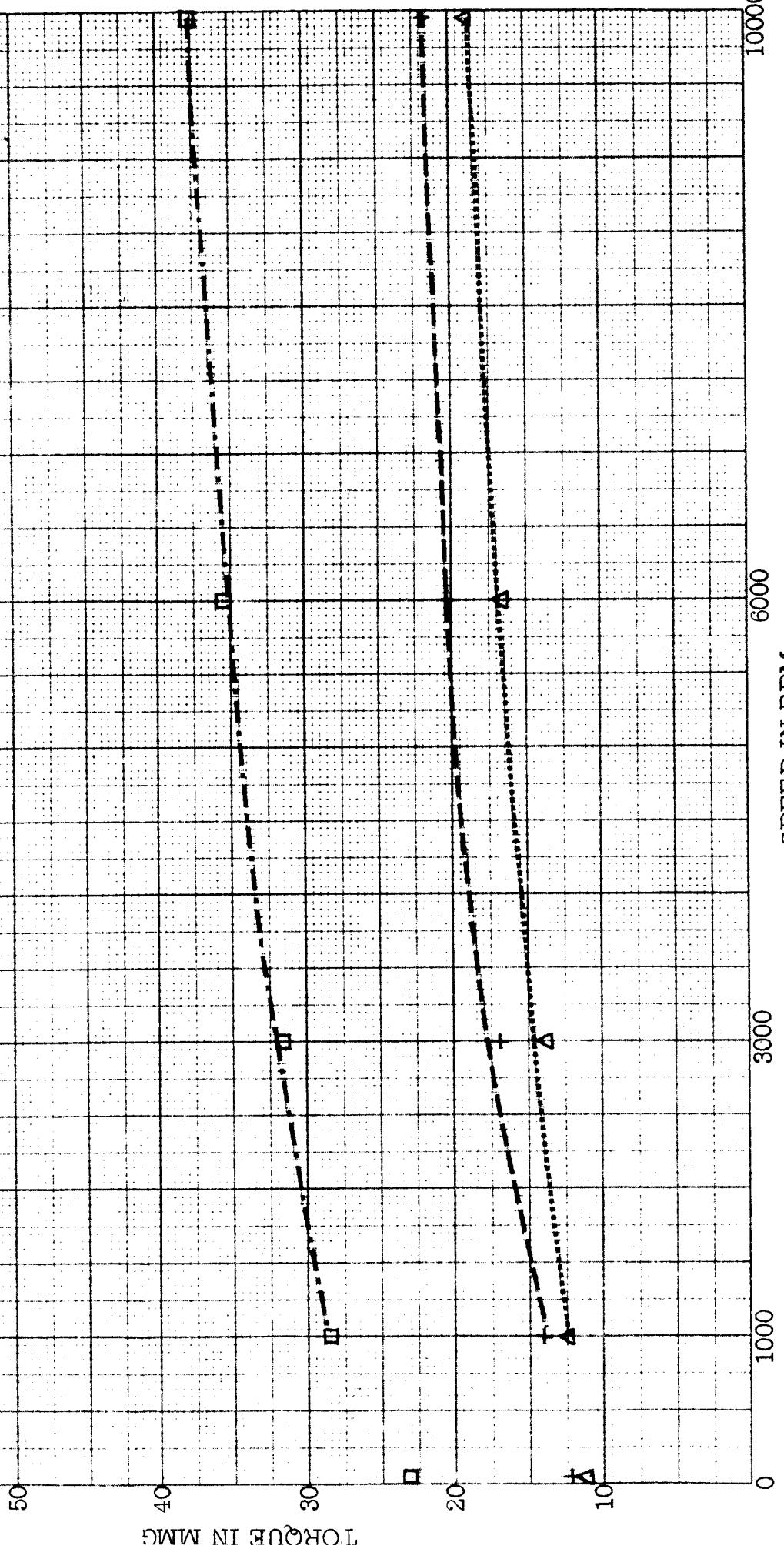
SFR2-6PPK68

1 Pound Load

Average of Four Bearings

Lube - MIL-L-6085A Centrifuged

70° F
21°C
20° F
-65° F
-54°C
-29°C



TORQUE IN MMG

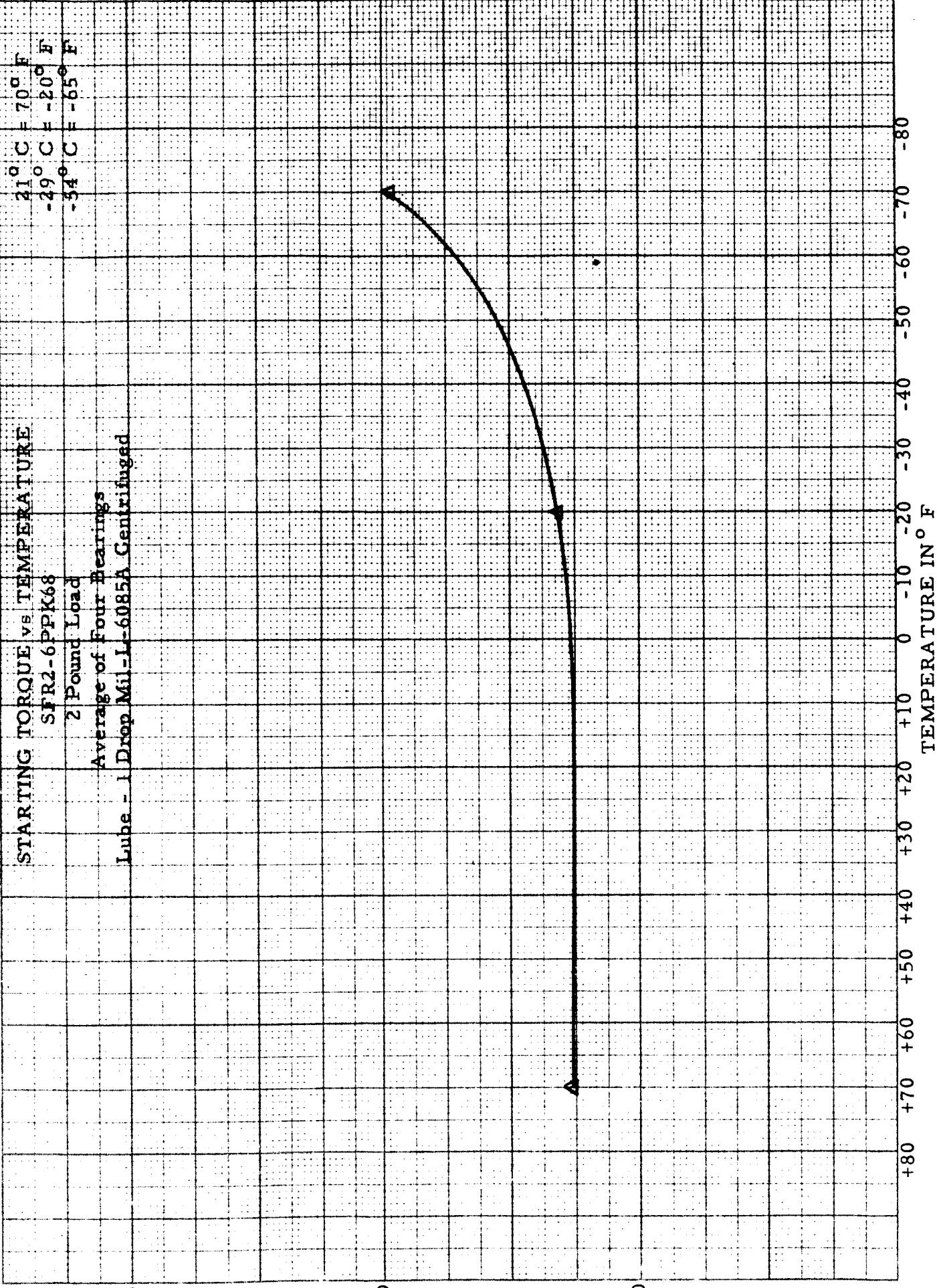
STARTING TORQUE vs TEMPERATURE

SFR2-6PPK68

2 Pound Load

Average of Four Bearings

Lube - 1 Drop Mil-L-6085A Centrifuged



TORQUE vs SPEED at VARIOUS TEMPERATURES

SFR2-6PPK68

2 Pound Load

Average of Four Bearings

Lube - MIL-L-6085A Centrifuged

21°C 70°F
20°C 68°F
-54°C 65°F

50

40

30

20

10

TORQUE IN MMG

1000

3000

6000

10000

SPEED IN RPM

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR2-6PPK68		1/2 Pound Load		Lube - Mil-L-6085A Centrifuged			
BRG. NO.	STARTING			1000 RPM	3000 RPM	6000 RPM	10,000 RPM
				70° F			
1	6,000			6,000	10,000	10,000	18,000
2	3,500			3,500	7,500	9,000	13,000
3	6,000			6,000	8,000	12,000	12,000
4	7,500			9,000	11,500	13,500	13,500
Avg.	5,750			6,125	9,250	11,125	14,125
				-20° F			
1	9,000			9,000	11,000	11,000	12,500
2	7,000			9,000	11,000	13,000	19,500
3	2,000			4,000	4,000	8,000	12,000
4	7,500			7,500	7,500	11,000	15,000
Avg.	6,375			7,375	8,375	10,750	14,750
				-65° F			
1	26,000			28,000	30,000	31,500	33,000
2	19,500			23,500	23,500	25,000	29,500
3	19,000			24,000	38,500	38,500	40,500
4	28,000			38,000	40,000	42,000	48,000
Avg.	23,125			28,375	33,000	34,250	37,750

Readings are in mgmm.

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR2-6PPK68		1 Pound Load	Lube - Mil-L-6085A Centrifuged			
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10,000 RPM
			70° F			
1	11,000		13,000	14,500	16,500	19,000
2	5,500		7,500	9,000	13,000	15,000
3	17,000		17,000	19,000	21,000	23,000
4	13,500		13,500	15,000	17,000	19,000
Avg.	11,750		12,750	14,375	16,875	19,000
			-20° F			
1	11,000		12,500	18,000	23,000	23,000
2	13,000		15,000	17,000	19,500	21,000
3	14,000		18,000	18,000	20,000	22,000
4	11,000		11,000	15,000	19,000	21,000
Avg.	12,250		14,125	17,000	20,375	21,750
			-65° F			
1	16,500		16,500	18,500	20,000	22,000
2	29,500		33,500	35,500	37,500	39,000
3	19,000		28,500	35,000	37,000	38,500
4	28,000		36,000	38,000	48,000	52,000
Avg.	23,250		28,625	31,750	35,625	37,875

Readings are in mgmm.

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR2-6PPK68		2 Pound Load		Lube - Mil-L-6085A Centrifuged			
BRG. NO.	STARTING			1000 RPM	3000 RPM	6000 RPM	10,000 RPM
				70° F			
1	10,000			14,500	14,500	18,000	19,000
2	5,500			7,500	9,000	15,000	17,000
3	17,000			19,000	28,000	28,000	30,000
4	19,000			21,000	24,000	26,000	26,000
Avg.	12,875			15,500	18,875	21,750	23,000
				-20° F			
1	14,500			16,000	16,000	18,000	19,500
2	11,000			17,000	19,500	21,000	25,500
3	18,000			41,000	43,000	43,000	45,000
4	9,500			11,000	13,000	15,000	17,000
Avg.	13,250			21,250	22,875	24,250	26,750
				-65° F			
1	13,000			16,500	18,500	20,000	26,000
2	19,500			23,500	25,000	29,500	39,000
3	19,000			28,500	35,000	38,500	40,500
4	28,000			38,000	40,000	44,000	44,000
Avg.	19,875			26,625	29,625	33,000	37,375

Readings are in mgmm.



STARTING TORQUE VS. TEMPERATURE

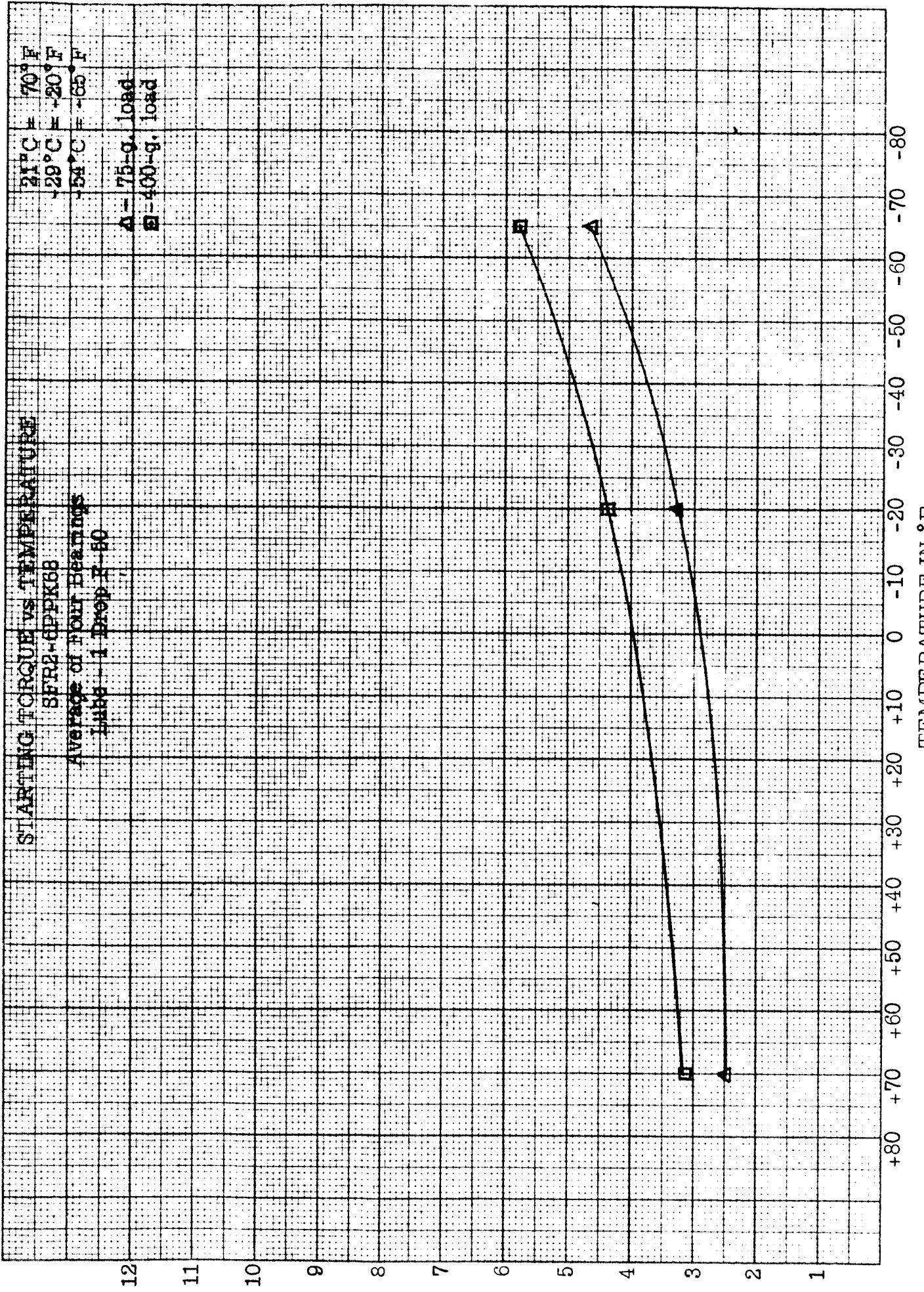
SETR2-6PEK6B

4 VOLT. 60 HZ.

Base - 1 Amp F-10

21°C = 70°F
20°C = 68°F
18°C = 65°F

A = 75-g. load
B = 400-g. load



TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR2-6PPK68

1 Drop F-50

Six Starts Per Bearing Under 75-Gram Load

Starts at 70°F

Brg. No.	1	2	3	4	5	6	Avg.
1	3000	3000	3000	3000	3000	3000	3000
2	2000	2000	2000	2000	2000	2000	2000
3	2000	2000	2000	2000	2000	2000	2000
4	3000	3000	3000	3000	3000	3000	3000

Average Total Torque of Four Bearings 2500

at -20°F

1	3000	3000	3000	3000	3000	3000	3000
2	3000	3000	3000	4000	4000	4000	3500
3	3000	3000	3000	3000	3000	3000	3000
4	3000	3000	4000	4000	4000	4000	3667
							Average Total Torque of Four Bearings 3292

at -65°F

1	5000	5000	5000	5000	5000	5000	5000
2	4000	4000	4000	4000	5000	5000	4334
3	3000	3000	4000	4000	4000	4000	3667
4	5000	5000	6000	6000	6000	6000	5667
							Average Total Torque of Four Bearings 4667

Readings are in mgmm

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR2-6PPK68

1 Drop F-50

Six Starts Per Bearing Under 400-Gram Load
Starts at 70° F

Brg. No.	1	2	3	4	5	6		Avg.
1	4000	4000	4000	4000	4000	4000		4000
2	2000	2000	2000	2000	2000	2000		2000
3	2000	2000	3000	3000	3000	3000		2667
4	3000	4000	4000	4000	4000	4000		3833
Average Total Torque of Four Bearings								3125

at -20° F

1	5000	5000	5000	5000	5000	5000		5000
2	4000	4000	4000	5000	5000	5000		4500
3	4000	4000	4000	4000	4000	4000		4000
4	4000	4000	4000	4000	4000	4000		4000
Average Total Torque of Four Bearings								4375

at -65° F

1	5000	5000	5000	6000	6000	6000		5500
2	6000	6000	6000	6000	6500	6500		6167
3	5500	6000	6000	6000	6000	6000		5917
4	5000	5000	5000	5000	6000	6000		5333
Average Total Torque of Four Bearings								5729

Readings are in mgmm

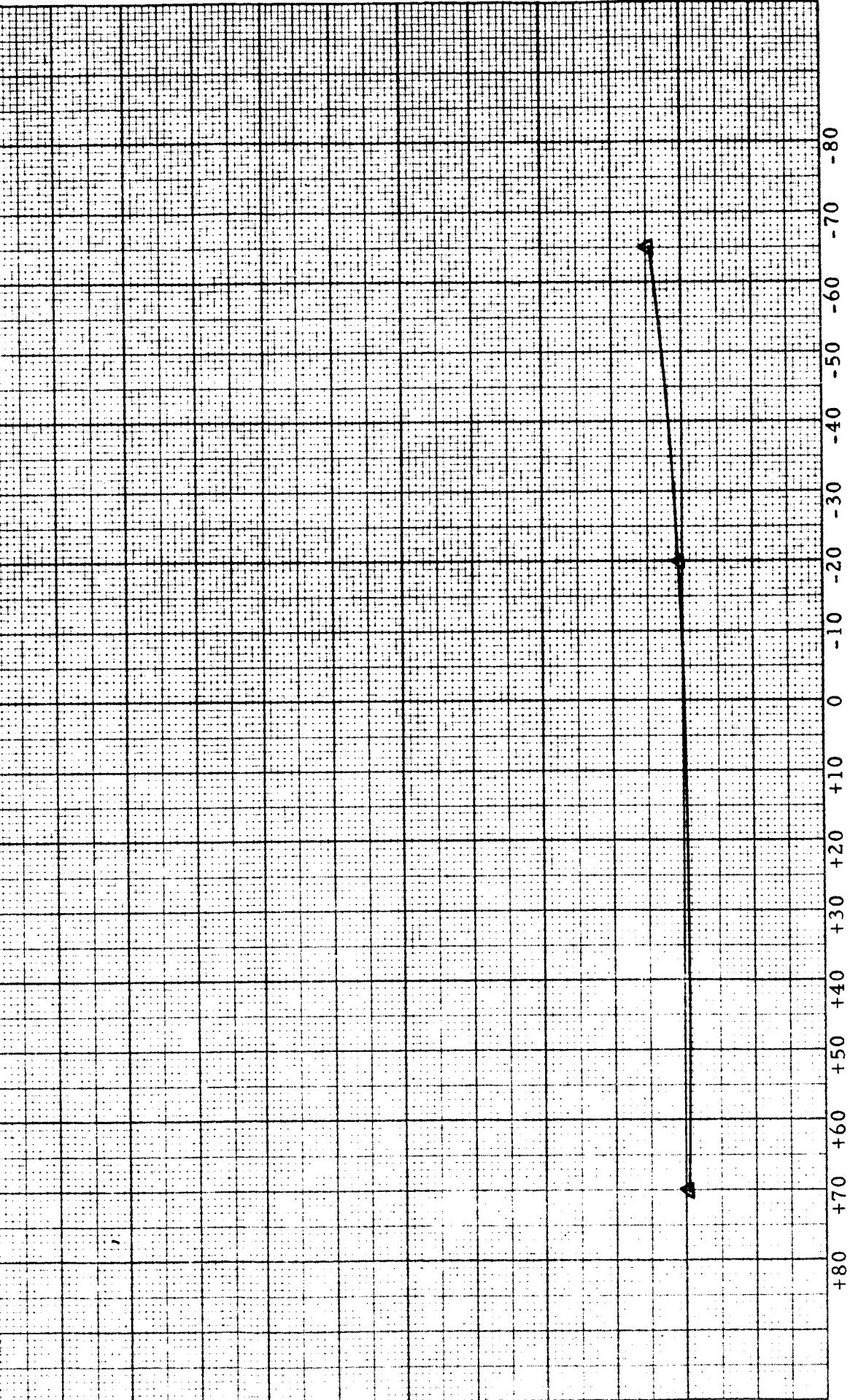
STARTING TORQUE vs. TEMPERATURE

SFR2-6PPK68

1/2 Pound Load

Average of Four Bearings
Lube - 1 Drag F-50

30



20

10

TORQUE vs SPEED at VARIOUS TEMPERATURES

SFR2-6PPK68

1/2 Found 1/2

Average of Four Readings

Lube - 1 Drop F-BD

21°C — 24°C — 70°F
20°C — 23°C — 60°F
15°C — 18°C — 65°F

50

40

30

20

10

0

TORQUE IN MILIG

0

3000

6000

10000

SPEED IN RPM

STARTING TORQUE vs TEMPERATURE

SFR2-6PPK68

1 Pound Load

Average of Four Bearings
Lube = 1 Drop E-50

30

21°C = 70°F

-29°C = -20°F

-54°C = -65°F

TORQUE IN MMG

20

10

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80

TEMPERATURE IN ° F

TOURQUE VS SPEED at VARIOUS TEMPERATURES

SPPR2-6PPPK68

1/4 Load

Average of Four Bearings

Table - 1 Deep R-B0
21°C - 70°F
28°C - 85°F
34°C - 95°F
41°C - 105°F

TOURQUE IN MMG

50

40

30

20

10

0

3000

1000

6000

10000

SPEED IN RPM

STARTING TORQUE VS TEMPERATURE

SFR2-6PPK68

2 Pound Load

Average of Four Experiments

Lube - 1 Drop E-50

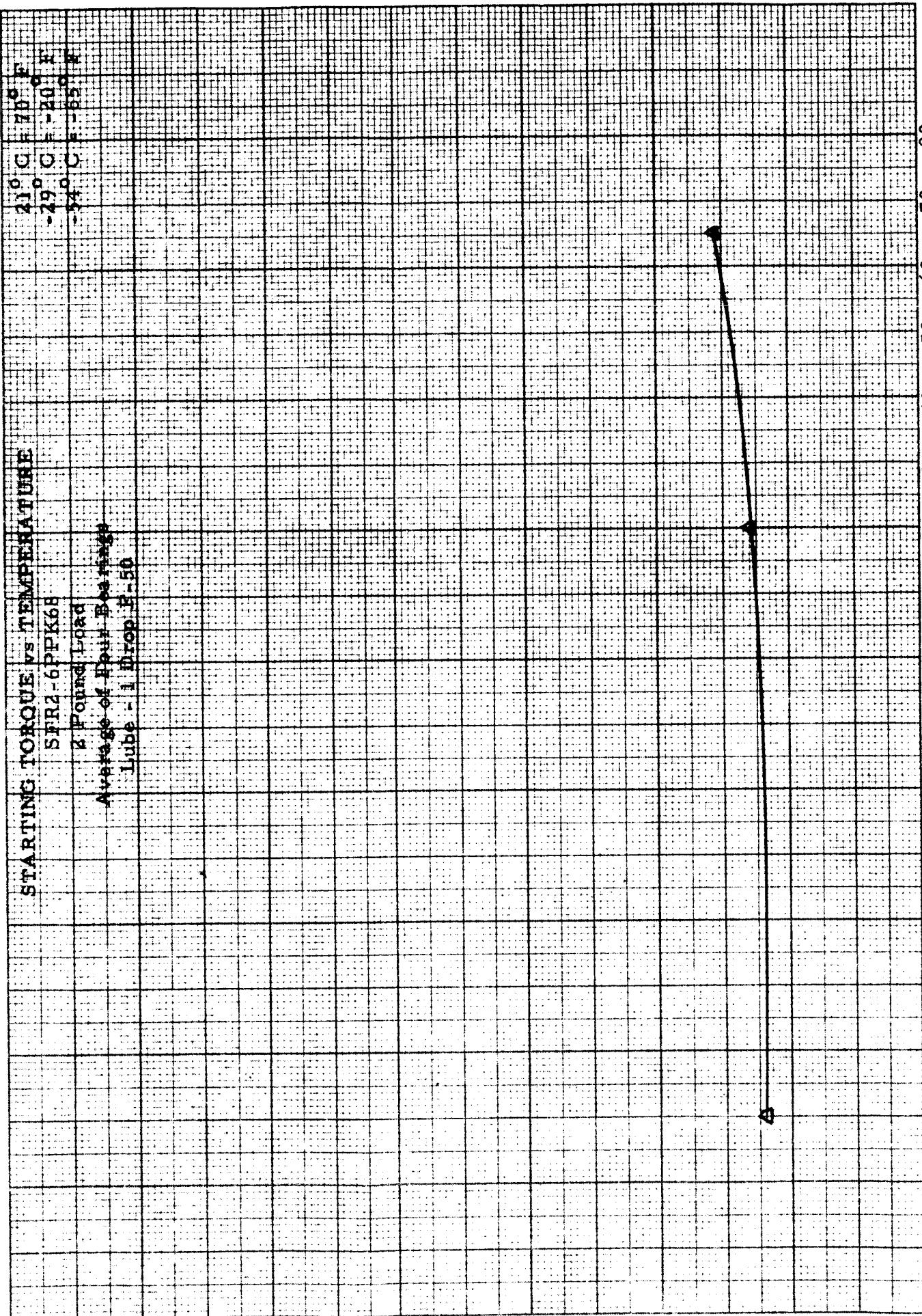
30

20

10

TORQUE IN MMG

+80 +70 +60 +50 +40 +30 +20 +10 0 -10 -20 -30 -40 -50 -60 -70 -80
TEMPERATURE IN ° F



TORQUE VS SPEED AT VARIOUS TEMPERATURES

SFR2-6PPK 68

2 Pound Load

Average of Four Tests

Tube - 1 Drop 3-60

20° F
20° C
54° C
54° C
21° C
20° C
20° F

.50

40

30

20

10

0

TORQUE IN MMG

0

3000

6000

10000

SPEED IN RPM

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR2-6PPK68		1/2 Pound Load	Lube - 1 Drop F-50			
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10,000 RPM
			$70^{\circ} F$			
1	6,000		6,000	7,500	9,000	11,000
2	3,500		5,000	5,000	7,000	9,000
3	4,500		8,000	10,000	11,500	11,500
4	6,000		6,000	7,500	9,500	11,000
Avg.	5,000		6,250	7,500	9,250	10,625
			$-20^{\circ} F$			
1	6,000		7,500	9,000	11,000	12,500
2	3,500		3,500	5,000	7,500	9,500
3	4,000		4,000	8,000	10,000	10,000
4	8,000		10,000	11,500	13,500	15,500
Avg.	5,375		6,250	8,375	10,500	11,875
			$-65^{\circ} F$			
1	7,000		9,000	11,000	16,500	18,500
2	7,000		7,000	9,000	10,500	10,500
3	4,000		6,500	8,500	11,000	11,000
4	7,000		7,000	9,000	10,500	12,500
Avg.	6,250		7,375	9,375	12,125	13,125

Readings are in mgmm.



TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR2-6PPK68		1 Pound Load		Lube - 1 Drop F-50		
BRG. NO.	STARTING		1000 RPM	3000 RPM	6000 RPM	10,000 RPM
			70° F			
1	7,500		7,500	9,000	11,000	11,000
2	5,000		5,000	7,000	9,000	11,000
3	6,000		8,000	10,000	10,000	11,500
4	6,000		6,000	7,500	11,000	11,000
Avg.	6,125		6,625	8,375	10,250	11,125
			-20° F			
1	7,500		9,000	9,000	11,000	12,500
2	5,000		5,000	7,500	7,500	9,500
3	4,000		4,000	6,000	6,000	8,000
4	6,000		8,000	10,000	11,500	11,500
Avg.	5,625		6,500	8,125	9,000	10,375
			-65° F			
1	7,000		7,000	9,000	11,000	15,000
2	4,000		7,000	10,500	10,500	12,000
3	6,500		8,500	11,000	11,000	12,500
4	7,000		9,000	10,500	10,500	12,500
Avg.	6,125		7,875	10,250	10,750	13,000

Readings are in mgmm.



TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR2-6PPK68		2 Pound Load		Lube - 1 Drop F-50			
BRG. NO.	STARTING			1000 RPM	3000 RPM	6000 RPM	10,000 RPM
				70° F			
1	6,000			6,000	7,500	9,000	11,000
2	5,000			7,000	7,000	9,000	9,000
3	6,000			8,000	10,000	11,500	11,500
4	7,500			9,500	9,500	11,000	11,000
Avg.	6,125			7,625	8,500	10,125	10,625
				-20° F			
1	7,500			9,000	11,000	12,500	14,000
2	5,000			7,500	7,500	9,500	11,000
3	6,000			8,000	8,000	10,000	12,000
4	8,000			10,000	11,500	13,500	15,500
Avg.	6,625			8,625	9,500	11,375	13,125
				-65° F			
1	7,000			9,000	13,000	15,000	16,500
2	7,000			9,000	10,500	12,000	12,000
3	8,500			11,000	14,000	17,000	21,000
4	9,000			10,500	14,500	18,000	21,500
Avg.	7,875			9,875	13,000	15,500	17,750
					Readings are in mgmm.		



STARTING TORQUE vs TEMPERATURE

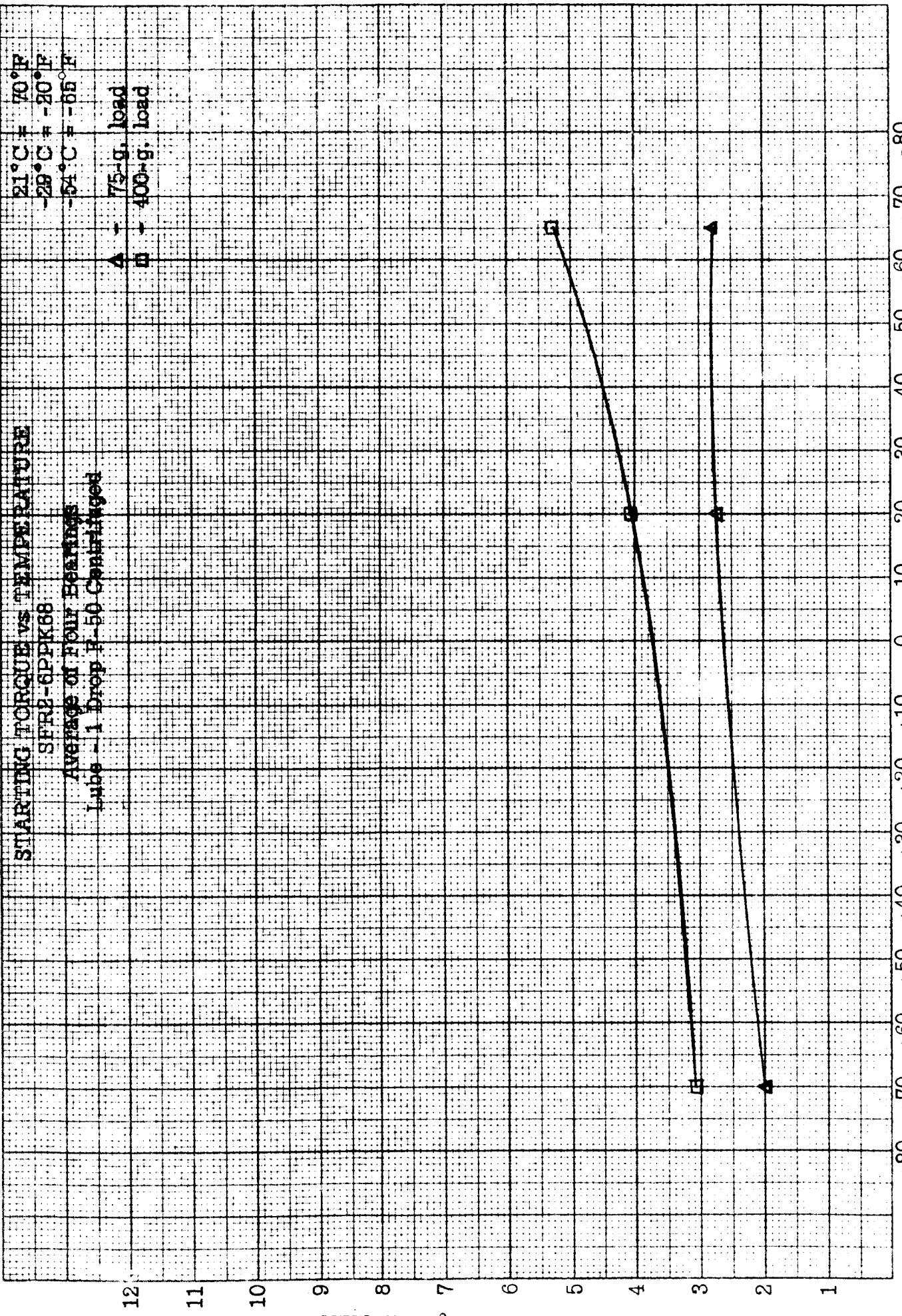
SER2-6PPK58

Average of Four Bearings

Lube - 1 Drop + 50 Contact Grease

21°C = 70°F
-28°C = -20°F
-54°C = -65°F

▲ = 75-g. load
■ = 400-g. load



TORQUE IN MMG

TEMPERATURE, TN °F

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR2-6PPK68

1 Drop F-50 Centrifuged
 Six Starts Per Bearing Under 75-Gram Load
 Starts at 70°F

Brg. No.	1	2	3	4	5	6	Avg.
1	1500	1500	1500	1500	1500	1500	1500
2	2000	2000	2000	2000	2000	2000	2000
3	2000	2000	2000	2000	2000	2000	2000
4	2000	3000	3000	3000	2000	2000	2500

Average Total Torque of Four Bearings 2000

at -20°F

1	3000	3000	3000	3000	3000	3000	3000
2	4000	4000	4000	4000	4000	4000	4000
3	2000	2000	2000	2000	2000	2000	2000
4	2000	2000	2000	2000	2000	2000	2000
							Average Total Torque of Four Bearings 2750

at -65°F

1	2000	2000	2000	2000	3000	3000	2333
2	3000	3000	3000	4000	4000	4000	3500
3	1000	1000	2000	2000	2000	2000	1667
4	3000	3000	4000	4000	4000	4000	3667
							Average Total Torque of Four Bearings 2792

Readings are in mgmm

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR2-6PPK68

1 Drop F-50 Centrifuged

Six Starts Per Bearing Under 400-Gram Load
Starts at 70° F

Brg. No.	1	2	3	4	5	6	Avg.
1	3000	3000	3000	3000	3000	3000	3000
2	1000	2000	2000	3000	3000	3000	2333
3	2000	3000	3000	3000	3000	3000	2833
4	3000	4000	4000	4000	5000	5000	4167

Average Total Torque of Four Bearings 3083

at -20° F

1	5000	5000	5000	5000	5000	5000	5000
2	3000	3000	3000	4000	4000	5000	3667
3	4000	4000	4000	4000	4500	4500	4167
4	3000	3000	3000	4000	4000	4000	3500
Average Total Torque of Four Bearings							4083

at -65° F

1	5000	5000	5000	5000	6000	6000	5333
2	6000	6000	6000	6500	6500	6500	6250
3	5500	5500	5500	5500	5500	5500	5500
4	4000	4000	4000	4000	4000	4000	4000
Average Total Torque of Four Bearings							5271

Readings are in mgmm

STARTING TORQUE vs TEMPERATURE

SER2-6PPK68

1/2 Pound Load

Average of Four Bearings

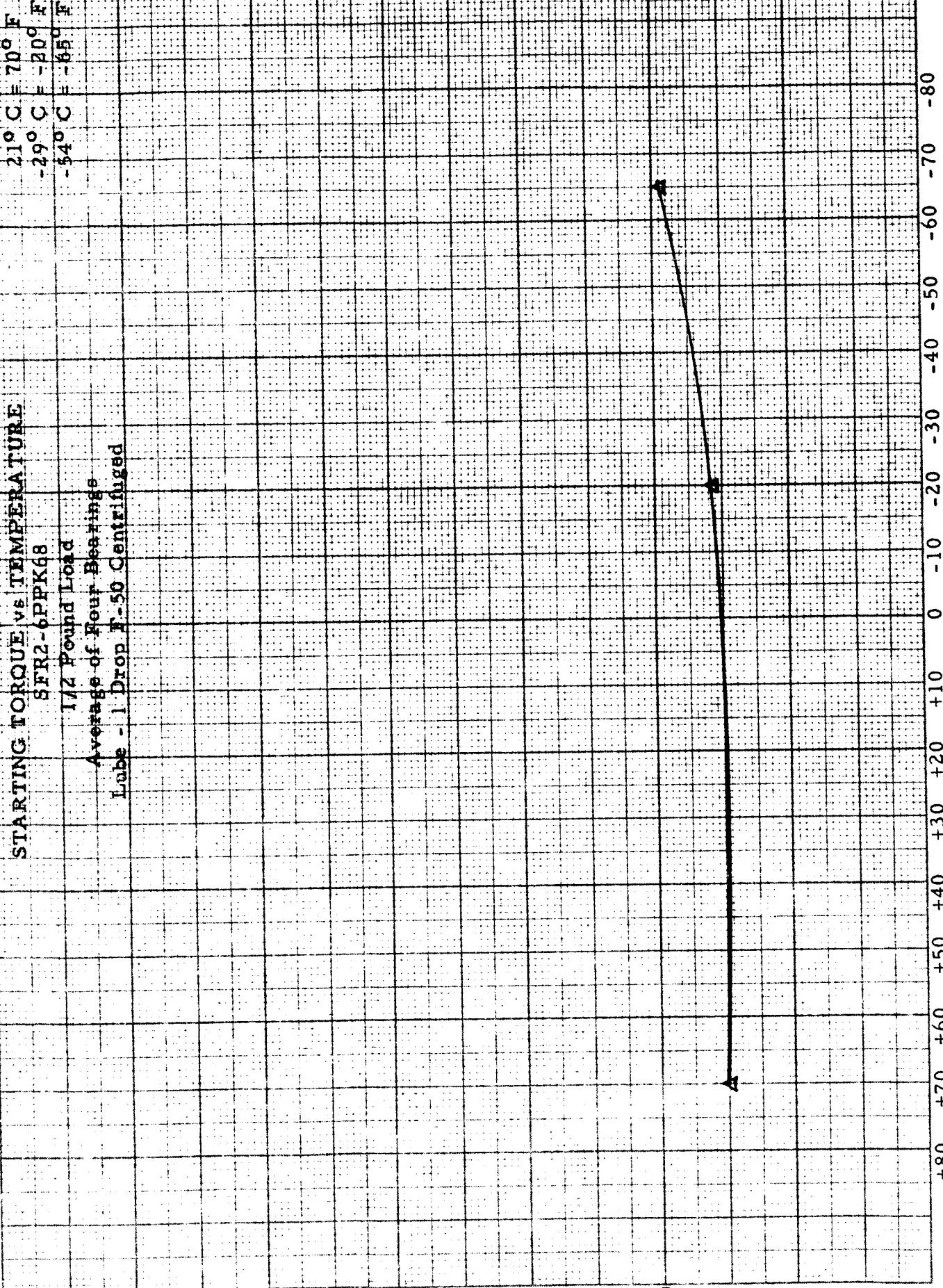
Lube - 1 Drop F-50 Centrifuged

30

TORQUE IN MMG

20

10



TORQUE VS SPEED at VARIOUS TEMPERATURES

SFR2-6PPK68

1/2 Pound Load

Average of Four Bearings

Lube - 1 Drop F-50 Centrifuged

-70° F.....
-20° F.....
21° C.....
-29° C.....
-44° C.....
65° F.....

50

40

30

20

10

0

TORQUE IN MMG

1000

3000

6000

10000

SPEED IN RPM

STARTING TORQUE vs TEMPERATURE

SFR2-6PPK68

1 Pound Load

Average of Four Bearings
Lube - 1 Drop T-50 Centrifuged

30

20

TORQUE IN MMG

21° C = 70° F

-29° C = -20° F

-54° C = -65° F

-80° C = -80° F

-104° C = -144° F

-138° C = -218° F

-173° C = -278° F

-208° C = -338° F

-243° C = -408° F

-278° C = -478° F

-313° C = -573° F

-348° C = -648° F

-383° C = -713° F

-418° C = -778° F

-453° C = -843° F

-488° C = -918° F

-523° C = -993° F

-558° C = -1068° F

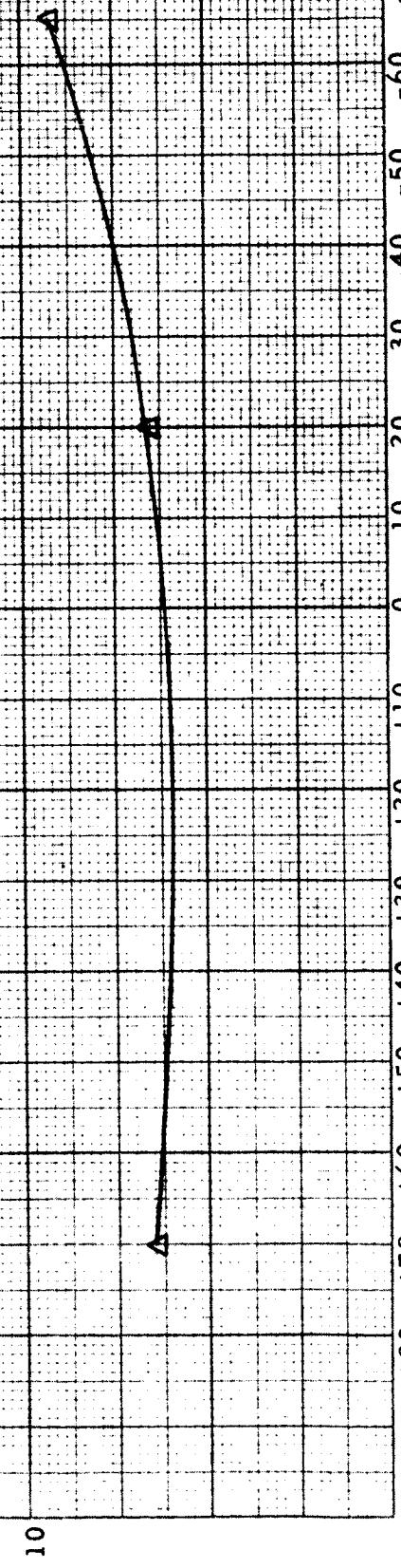
-593° C = -1143° F

-628° C = -1218° F

-663° C = -1293° F

-700° C = -1298° F

TEMPERATURE IN ° F



TORQUE vs SPEED at VARIOUS TEMPERATURES

SFR2-6PPK68

1 Pound Load

Average of Four Bearings

Lube - 1 Drop F-50 Centrifuged

-70° E
-20° F
-54° C
-65° F

TORQUE IN MMG

10000

6000

3000

1000

0

SPEED IN RPM

STARTING TORQUE vs TEMPERATURE

SFR2-6PPK68

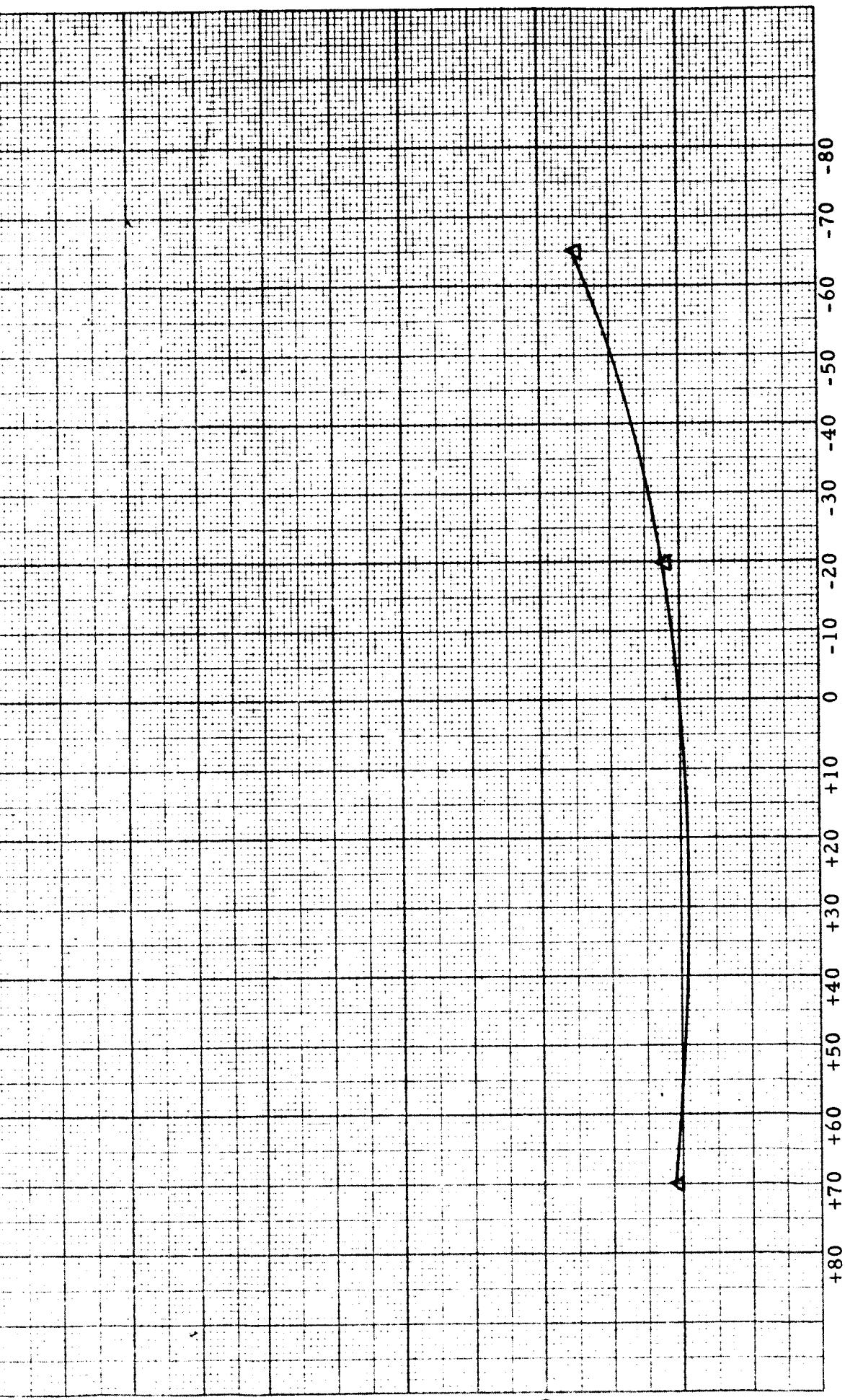
2 Pound Load

Average of Four Bearings

Lube - 1 Drop E-50 Centrifuged

30

TORQUE IN MMG



TORQUE VS SPEED at VARIOUS TEMPERATURES

SFR2-6PPK68

2 Pound Load

Average of Four Bearings
Tube - 1 Drop F-50 Centrifuged
-21°C - - - - - 70°F
-29°C - - - - - 30°F
-35°C - - - - - 65°F

50

40

30

20

10

0

TORQUE IN MCG

1000

3000

6000

10000

STIFFENED DDM

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR2-6PPK68		1/2 Pound Load	Lube-1 Drop	F-50 Centrifuged	
BRG. NO.	STARTING	1000 RPM	3000 RPM	6000 RPM	10000 RPM
		70°F			
1	6,000	7,500	9,000	11,000	12,500
2	5,000	5,000	7,500	9,000	9,000
3	4,000	6,000	6,000	7,500	10,000
4	6,000	7,500	7,500	9,000	11,000
Avg.	5,250	6,500	7,500	9,125	10,625
		-20°F			
1	6,000	6,000	9,000	9,000	11,000
2	5,000	7,500	9,000	11,000	15,000
3	4,000	4,000	6,000	7,500	7,500
4	7,500	7,500	9,000	11,000	13,000
Avg.	5,625	6,250	8,250	9,625	11,625
		-65°F			
1	9,000	9,000	11,000	12,000	15,000
2	11,000	13,000	15,000	17,500	19,000
3	8,000	8,000	11,000	12,000	14,000
4	7,000	7,000	9,000	11,000	11,000
Avg.	8,750	9,250	11,500	13,125	14,750

Readings are in mg/mm

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR2-6PPK68		1 Pound Load		Lube - 1 Drop F-50 Centrifuged			
BRG. NO.	STARTING			1000 RPM	3000 RPM	6000 RPM	10000 RPM
				70°F			
1	6,000			7,500	9,000	11,000	12,500
2	7,500			7,500	9,000	9,000	11,000
3	6,000			7,500	10,000	10,000	11,000
4	7,500			9,000	11,000	11,000	13,000
Avg.	6,750			7,875	9,750	10,250	11,875
				-20°F			
1	6,000			7,500	9,000	11,000	12,500
2	9,000			15,000	17,000	19,000	21,000
3	4,000			7,500	7,500	9,000	11,000
4	7,500			9,000	11,000	13,000	15,000
Avg.	6,625			9,750	11,125	13,000	14,875
				-65°F			
1	7,000			9,000	11,000	16,000	18,000
2	11,000			12,000	13,000	15,000	18,000
3	8,000			11,000	12,000	14,000	16,000
4	11,000			12,000	12,000	14,000	18,000
Avg.	9,250			11,000	12,000	14,750	17,500

Readings are in mgmm

TORQUE VALUES OF INDIVIDUAL BEARINGS

SFR2-6PPK68		2 Pound Load		Lube - 1 Drop F-50 Centrifuged		
BRG. NO.	STARTING	1000 RPM	3000 RPM	6000 RPM	10000 RPM	
		70°F				
1	7,500	17,500	19,000	21,000	26,000	
2	9,000	12,500	19,000	23,000	23,000	
3	7,500	10,000	17,500	20,000	23,000	
4	6,000	7,500	9,000	11,000	15,000	
Avg.	7,500	11,875	16,125	18,750	21,750	
		-20°F				
1	9,000	17,500	27,500	29,000	29,000	
2	7,500	11,000	17,000	19,000	21,000	
3	7,500	15,000	17,500	22,000	23,000	
4	7,500	19,000	20,000	22,000	22,000	
Avg.	7,875	15,625	20,500	23,000	23,750	
		-65°F				
1	9,000	12,000	20,000	21,000	23,000	
2	8,000	13,000	15,000	16,000	19,000	
3	11,000	19,000	21,000	23,000	25,000	
4	11,000	12,000	18,000	21,000	23,000	
Avg.	9,750	14,000	18,500	20,250	22,500	

Readings are in mgmm